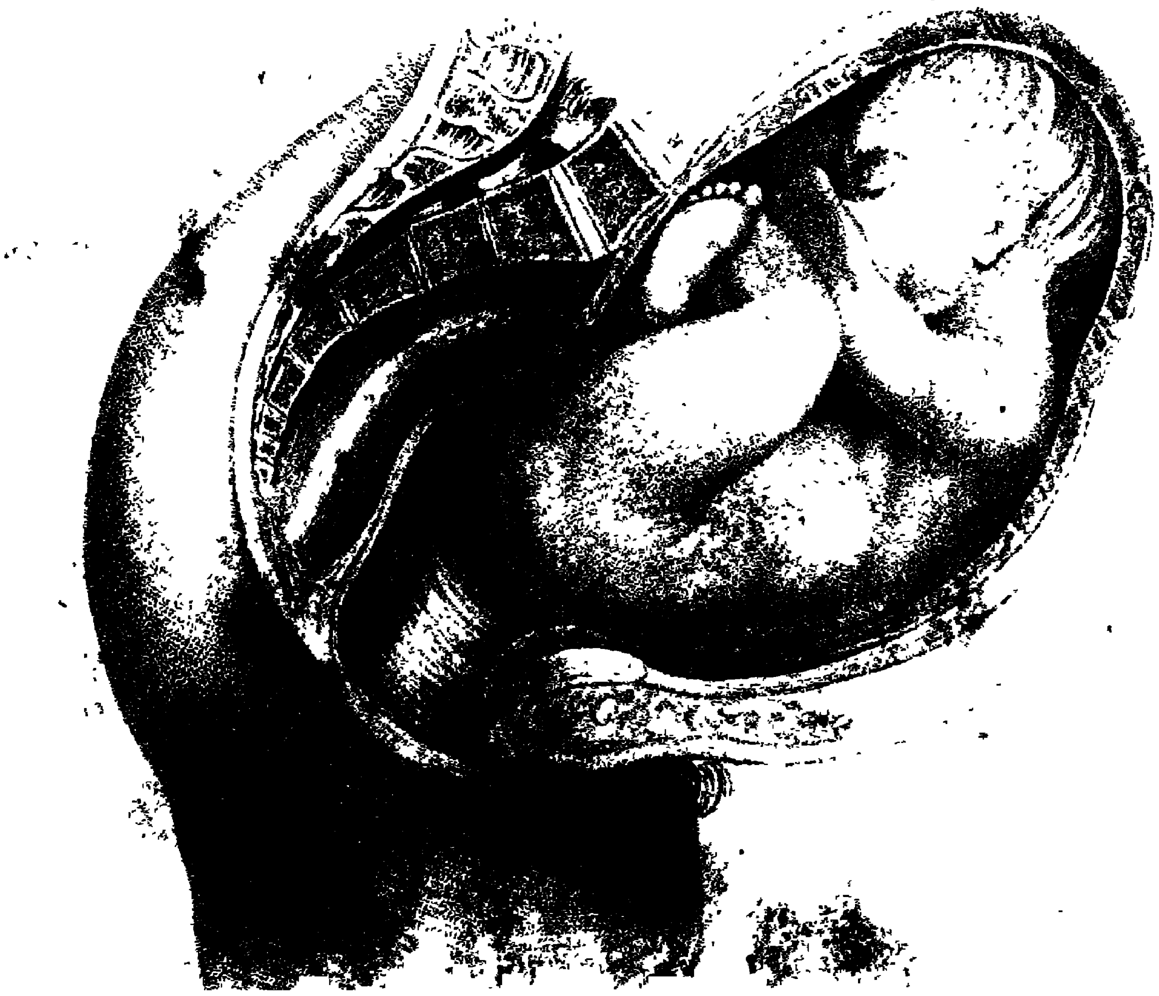

OBSTETRIC MEDICINE

AND

SURGERY.

PRINCIPLES AND PRACTICE

[illegible]ETRIC MEDICINE & SURGERY

IN REFERENCE TO

THE PROCESS OF PARTURITION.

ONE HUNDRED AND TWENTY ILLUSTRATIONS ON STEEL AND WOOD

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FOURTH EDITION, REVISED.

Τὰ μὲν ἄλλα κα[illegible] [illegible]λιμος καὶ μεταβολὴ [illegible]
ἡ Τέχνη δὲ σώζεται

LONDON

LONDON
BRADBURY AND EVANS, PRINTERS, WHITEFRIARS.

TO

SIR CHARLES MANSFIELD CLARKE, BART.,

M.D., F.R.S., &c. &c.

THIS, THE FOURTH EDITION OF

A WORK INTENDED TO FACILITATE THE STUDY OF AN IMPORTANT DEPARTMENT OF MEDICINE,

WHICH

HE HIMSELF FORMERLY TAUGHT WITH SO MUCH ABILITY AND SUCCESS,

Is Inscribed,

BY

HIS OBEDIENT SERVANT, AND FAITHFUL FRIEND,

THE AUTHOR.

ADVERTISEMENT TO THE FIRST EDITION.

TOWARDS the close of the year 1839, I was applied to by the highly respectable house, through which this publication is offered to the medical profession, to select the subjects for it, and to contribute the letter-press; and I readily undertook a duty which I thought would supply a deficiency in English Obstetric Literature.

When the work was first projected, it was intended to be merely an ATLAS OF PLATES, with a short description of each, as its title then conveyed. But circumstances afterwards arose, which induced those interested in its success to extend it into a form more approaching that of a treatise; and I trust this alteration has been effected without detracting from its usefulness.

The flattering notices which it has received from the periodical press in the progress of its publication, and the liberal patronage it has met with from the profession, have not only been most gratifying, but have also stimulated the proprietor to a much larger outlay of capital than was anticipated at the commencement. This remark has reference to the plates as well as to the extended text; and I should be doing injustice equally to my own feelings, as to the talents of a highly-gifted artist, if I did not acknowledge the valuable assistance I have received in the prosecution of the work from Mr. William Bagg; to whose judgment and taste, exemplified in the drawings, I consider it owes a very great part of its merit.

PREFACE TO THE FIRST EDITION.

Should any apology be deemed necessary for obtruding on the medical public a new work on obstetric science, it may, perhaps, be furnished by the interest which that department of medicine has acquired of late years, and the attention it now commands from the profession. The numerous valuable publications on the subject that have recently issued from the press, forcibly demonstrate the high position it has attained as a part of medical studies; and it is confidently hoped that the present addition to the stock of obstetric literature, drawn up on a somewhat novel plan, will not be considered altogether superfluous.

This branch of physic, indeed, has struggled against far greater difficulties than have beset the general practice of medicine and surgery; for both ignorance and prejudice have lent their aid towards retarding its advancement. On the one hand, it has had to contend with the natural prejudices that females themselves must entertain against admitting a person of the opposite sex to undertake the duties required under the trying time of labour; and on the other, with the erroneous belief that parturition, being a natural action, must be accomplished in woman with equal facility and safety as in the brute creation. Arguments, sufficiently strong and numerous, could be adduced to prove the fallacy of the latter assumption, but they are foreign to our immediate purpose. And although the change has been effected but slowly, the prejudice existing in the female breast has now, happily for them, given way to a sense of the security they enjoy in placing themselves under the superintendence of well-educated surgeons.

The continental universities took the lead in enrolling *midwifery*, as it is called, among their obligatory studies; and most of the British institutions of a like nature have tardily followed in their steps. It cannot be necessary to enforce by reasoning the propriety of the regulations they have adopted; but whatever circumstances may have impelled them to such decisions, cannot be devoid of interest, and are therefore worthy of being recorded.

As far as the London corporations are concerned, much may be attribute[illegible] the exertions of a society established in 1826, under the ti[illegible]of the Obstetric Society of London. This body consisted of [illegible]ty members, embracing, with the exception of two or three, all the then present and late lecturers on obstetric medicine in London, besides a few other practitioners; and the author of this work acted as honorary secretary. The object of the society was to place the practice of obstetric medicine on a more respectable footing than it had hitherto enjoyed. It was proposed to accomplish this by inducing the Colleges of Physicians and Surgeons of this city to abrogate their bye-laws, which precluded practitioners in "midwifery" from the fellowship of the one, and a seat at the council-board of the other; and by requiring the College of Surgeons, and Society of Apothecaries, not only to make obstetric science the subject of examination, but to oblige all candidates who offered themselves for their diploma to adduce testimonials of having diligently applied themselves to its study.

A lengthened correspondence passed between the committee and the secretary of state for the home department, as also with the London medical corporations. Sir Robert Peel, at that time at the head of the Home Office, entered warmly into the question, honoured a deputation of the society with an interview, put himself in communication with the medical corporations on the subject of the memorials addressed to him, and allowed a great part of the correspondence which passed between them and the society to be transmitted through his office.

All the objects which the society proposed have since been carried into effect, except the change in the constitution of the council of the College of Surgeons: and thus, to the perseverance of a very few members of the profession may justly be attributed the adoption of measures fraught with the highest possible advantage to the community, inasmuch as they tend to enhance the acquirements of the great mass of English practitioners.

PREFACE TO THE FOURTH EDITION.

◆

Being called upon to superintend a fourth reprint of this work, I have gladly undertaken the task, supported by the pleasing reflection, that it must have met with the approbation of my medical brethren, considering that *six thousand copies* have passed through the hands of the publisher, since its first appearance.

To the second edition were added the *diseases of the puerperal and pregnant states*, and some *tables* from the practice of the Royal Maternity Charity; to the last, a paper on *anæsthetics*, as applied to ordinary labour, some remarks on the *use of galvanism* in lingering labour, on *turning the child in cases of head presentation*, when there exists a contracted pelvic brim,—and on *the removal of the placenta before the child*, in cases of placenta prævia. *Another coloured plate* was also introduced to illustrate the difference between the true and false corpora lutea; the connection between the *maternal and fœtal systems* through the intervention of the secundines was more fully entered into; and an attempt was made *to account for the first-drawn sob*,—the prelude to the all-important function of respiration.

For this present edition the essay on anæsthetics has been rewritten; and a great many emendations and additions have been made throughout the work, too inconsiderable, however, in themselves to merit a special enumeration.

It only remains for me again to express my gratification at the continued patronage that the book has met with, and my gratitude for the manner in which my endeavours to illustrate an important, difficult, and eminently practical department of medicine have been received by my professional contemporaries. Nor can it fail to be a source of pride to me, that the work has passed through a series of editions in America, issued from the press of Philadelphia, a city which has given to the world some publications on this department of medicine that will bear honourable comparison with any produced in the mother country.

7, Portman Square,
November, 1855.

CONTENTS.

Page

DEDICATION v

ADVERTISEMENT TO FIRST EDITION vii

PREFACE TO FIRST EDITION ix

DITTO TO FOURTH EDITION xiii

DESCRIPTION OF THE PLATES xix

INSTRUCTIONS TO THE BINDER xxiv

OF THE PELVIS 1

OF THE FOETAL HEAD 15

OF DEFORMED PELVES 20

OF PELVIMETERS 27

OF THE FEMALE GENERATIVE ORGANS 32

———— EXTERNAL . . . . ib.

———— INTERNAL 35

OF THE PELVIC CONTENTS 53

OF THE GRAVID UTERUS AND CONTENTS 57

OF THE DEVELOPMENT OF THE UTERUS 87

ON LABOUR 89

- OF NATURAL LABOUR 103
  - OF THE MANAGEMENT OF NATURAL LABOUR 119
  - OF THE AFTER-TREATMENT 146
  - OF ANÆSTHESIA IN LABOUR 156
  - OF THE IRREGULARITIES OF HEAD PRESENTATIONS . . 192
- OF DIFFICULT LABOUR 204
  - OF LINGERING LABOUR . . . . ib.
  - OF THE ERGOT OF RYE 207
  - OF INSTRUMENTAL LABOUR 262

Page
OF THE FORCEPS 264
OF THE VECTIS 283
OF THE FILLET 290
OF THE LONG FORCEPS 292
OF CRANIOTOMY 302
OF THE SIGNS OF THE DEATH OF THE FŒTUS 314
OF THE CÆSAREAN OPERATION 320
OF THE SIGAULTEAN OPERATION 324
OF THE INDUCTION OF PREMATURE LABOUR 327
OF THE CONSEQUENCES OF LABORIOUS LABOUR 335
OF PRETERNATURAL LABOUR 338
  OF BREECH PRESENTATIONS . . . . ib.
  OF KNEE PRESENTATIONS 349
  OF FOOTLING PRESENTATIONS 350
  OF DIFFICULT BREECH PRESENTATIONS 352
  OF TRANSVERSE PRESENTATIONS 360
  OF SHOULDER PRESENTATIONS 363
  OF ELBOW PRESENTATIONS . . . . ib.
  OF HAND PRESENTATIONS 364
  OF SIDE PRESENTATIONS . . . . ib.
  OF BACK PRESENTATIONS 365
  OF STERNAL PRESENTATIONS . . . . ib.
  OF ABDOMINAL PRESENTATIONS . . . . ib.
OF THE OPERATION OF TURNING 366
  OF THE MORE DIFFICULT TRANSVERSE PRESENTATIONS . . 374
OF THE SPONTANEOUS EVOLUTION 382
OF EXVISCERATION 384
OF DECAPITATION . . . . ib.
OF AMPUTATING THE ARM 387
OF COMPLEX LABOURS 388
  OF UTERINE HÆMORRHAGE IN ALL ITS VARIETIES, CONNECTED WITH LABOUR 389
  OF PUERPERAL CONVULSIONS 474
  OF RUPTURE OF THE UTERUS 495
  OF LACERATED VAGINA 506

Page

COMPLEX LABOURS—*continued.*

OF RUPTURED BLADDER 507
OF COLLAPSE 509
OF PROLAPSED NAVEL-STRING 511
OF DESCENT OF THE HAND WITH THE HEAD 517
OF EXCESSIVE QUANTITY OF LIQUOR AMNII 519
OF MONSTERS 521
OF PLURAL BIRTHS 522
THE DISEASES OF THE PUERPERAL STATE 539
OF THE SEPARATION OF THE RECTI MUSCLES OF THE ABDOMEN FROM EACH OTHER 540
OF PROLAPSUS UTERI 541
OF PROFUSE LOCHIAL DISCHARGE 542
OF SUPPRESSED LOCHIA 543
OF HÆMORRHOIDS . . . . ib.
OF VIOLENT AFTER-PAINS 544
OF VASCULAR CONGESTION OF THE UTERUS 546
OF HYSTERITIS 548
OF INFLAMMATION OF THE MAMMA 552
OF EXCORIATED NIPPLES 557
OF RETRACTED NIPPLES 561
OF PHLEGMASIA DOLENS 562
OF ŒDEMA 574
OF PARALYSIS . . . . ib.
OF MILK FEVER . . . . ib.
OF EPHEMERA 576
OF MILIARY FEVER 578
OF PUERPERAL MANIA 580
OF PUERPERAL FEVER 596
OF PERITONITIS 598
OF TYMPANITES 619
OF FALSE PERITONITIS 624
OF TYPHUS IN THE PUERPERAL STATE 626
OF HIDROSIS 629
OF SCARLET FEVER IN THE PUERPERAL STATE . . . 636

Page

OF THE DISEASES OF PREGNANCY 640

OF THE SYMPTOMS DEPENDENT ON PRESSURE . . . 641

— — — — DISTENSION 643

— — — — INFLAMMATORY ACTION . . ib.

OF SPECIFIC CONTAGION 645

OF ASCITES 646

OF ANOMALOUS SYMPTOMS . . . . . . ib.

OF RETROVERSION OF THE UTERUS 647

OF THE INTRODUCTION OF THE CATHETER 655

OF EXTRA-UTERINE CONCEPTION 662

OF ABORTION 683

APPENDIX 705

INDEX 757

DESCRIPTION OF THE PLATES.

Plate

1. OUTLINE of the male and female form.
2. Fig. 1, front view of the male skeleton pelvis. Fig. 2, ditto of the female.
3. Fig. 1, brim of the female pelvis. Fig. 2, outlet of ditto.
4. Fig. 1, section of a male skeleton pelvis. Fig. 2, ditto of a female skeleton pelvis.
5. Fig. 1. front view of the fœtal skull. Fig. 2, side view of ditto.
6. Fig. 1, view of the anterior fontanelle. Fig. 2, of the sagittal suture.
7. View of the occiput, and posterior fontanelle.
8. Slightly deformed pelves.
9. Excessively deformed pelves;—angular distortion.
10. Fig. 1, excessively deformed pelvis. Fig. 2, deformed pelvis.
11. Excessively deformed pelves;—elliptical distortion.
12. Fig. 1, pelvimeters applied. Fig. 2, mode of measuring a deformed pelvis by the index finger.
13. Fig. 1, mode of measuring a deformed pelvis by the whole hand. Fig. 2, by the two first fingers of the left hand.
14. External organs of generation in the female.
15. Internal organs of generation in the female.
16. Fig. 1, lateral section of the unimpregnated uterus. Fig. 2, infantile uterus laid open. Fig. 3, cavity of the adult uterus.
17. Corpora lutea. Fig. 1, ovary without a corpus luteum. Fig. 2, external surface of the ovary with a corpus luteum. Figs. 3, 4, 5, 6, true corpora lutea. Figs. 7, 8, false corpora lutea.

Plate

17 A. Corpora lutea. Fig. 1, unopened ovary, containing a recent true corpus luteum. Fig. 2, the same ovary opened. Fig. 3, another ovary opened containing a true corpus luteum. Fig. 4, an ovary opened, displaying a false corpus luteum of large size. Fig. 5, a coagulum of blood effused into the structure of the ovary.

18. Lateral section of the female pelvis, with its contents.

19. View of the viscera of the female pelvis—regarding them from the abdomen.

20. Arteries of the uterus.

21. Nerves of the uterus.

22. Fig. 1, a portion of the deciduous membrane; face next the ovum. Fig. 2, the same; face next the uterus. Fig. 3, double layer of deciduous membrane, surrounding an ovum about seven weeks old.

23. Figs. 1 and 2, ova about five and six weeks old; the first shows the filamentous vessels entirely surrounding it; the second partially. Fig. 3, an ovum of about eight weeks old, showing the placenta when first formed. Fig. 4, a blighted ovum, about seven or eight weeks old.

24. An ovum of five months age within the uterus; portions of deciduous membrane are attached to the chorion.

25. An ovum of five months age.

26. Views of the placenta. Fig. 1, fœtal face. Fig. 2, maternal face.

27. Fig. 1, battledore placenta, taken from an injected specimen. Fig. 2, longitudinal division of a portion of the funis umbilicalis, to show the cells containing the gelatine.

28. Fig. 1, twin placentæ. Fig. 2, umbilical vesicle in an ovum between five and six weeks old. Fig. 3, ditto in an ovum between seven and eight weeks old.

29. Fig. 1, the os uteri at the end of the third month of gestation. Fig. 2, at the end of six months. Fig. 3, at the end of nine months.

30. Fig. 1, uterus at the commencement of the fifth month of pregnancy. Fig. 2, arteries of the umbilical cord, twisted.

31. Gravid uterus at the full period of pregnancy, in the abdominal cavity.

Plate

32. Gravid uterus opened, to show the natural position of the fœtus within the cavity.
33. Side view of the uterus and pelvic cavity: the os uteri entirely dilated; the membranes protruding into the vagina, as in labour.
34. Fœtal skulls adapted to skeleton pelves, the vertex presenting. Fig. 1, forehead to right ilium. Fig. 2, forehead to left ilium.
35. Ditto. Fig. 1, forehead to right sacro-iliac synchondrosis. Fig. 2, to left ditto.
36. Ditto. Fig. 1, to right groin. Fig. 2, to left groin.
37. Ditto. Fig. 1, forehead impinging on the sacral promontory. Fig. 2, ditto above the symphysis pubis.
38. Labour considerably advanced; head in the pelvis; the forehead to right sacro-iliac synchondrosis.
39. Face turned into the sacral cavity; vertex external· forehead distending the perineum, the right shoulder entering the pelvis towards the right groin, the left towards the left sacro-iliac symphysis.
40. Perineum distended; the vertex protruded between the labia.
41. Head expelled; face turned to the right thigh; the right shoulder behind the symphysis pubis; the left occupying the sacral cavity.
42. Examination in labour. Fig. 1, with index finger of the right hand, the os uteri just opening. Fig. 2, with two fingers of the left hand, the os uteri more dilated.
43. The forehead passing under the pubes; the back part of the thorax occupying the cavity of the sacrum: the original presentation having been with the face to the right groin.
44. Brow presentation, adapted to a skeleton pelvis.
45. Face presentation, adapted to a skeleton pelvis.
46. Chin appearing under the pubes; the original presentation having been that of the face.
47. Ear presentation adapted to a skeleton pelvis.
48. An enlarged ovary, blocking up the pelvic cavity in labour.
49. A polypus occupying the pelvic cavity in labour.
50. The bladder distended and prolapsed before the head of the child.
51. Fig. 1, a dropsical head. Fig. 2, the same adapted to a skeleton pelvis.

Plate

52. Forceps applied to the head, the face being in the hollow of the sacrum.
53. Forceps applied to the head, the face towards the right sacro-iliac synchondrosis.
54. Ditto, the face towards the right groin; the bladder slightly distended.
55. Application of the vectis, in a face presentation, the chin impinging under the symphysis pubis.
56. Long forceps applied; the right brow towards the right sacro-iliac symphysis.
57. Craniotomy by means of Smellie's scissors; the pelvis distorted.
58. Craniotomy;—the use of the crotchet.
59. Craniotomy;—the craniotomy forceps applied.
60. The head of a premature fœtus passing through the brim of a distorted pelvis.
61. Breech presentation; the fœtal face towards the mother's spine.
62. Breech passing through the external parts.
63. Feet presentation; the back of the fœtus towards the mother's spine.
64. Knee, foot, and funis presentation.
65. The breech expelled; the right hand of the attendant engaged in drawing down a loop of the umbilical cord.
66. To exemplify *mala-praxis*, the body of the child having been extracted, the attendant is endeavouring to draw the head through the pelvic brim, with the forehead against the promontory of the sacrum, and the occiput above the symphysis pubis;—the long diameter of the child's head being in the direction of the short diameter of the brim of the pelvis.
67. Relieving the left arm from the pelvic cavity, the right having been already extracted.
68. Extracting the head through the outlet of the pelvis, the point of the index finger of the left hand being inserted into the mouth, the two first fingers of the right surrounding the neck.
69. Breech presentation; the blunt hook applied.
70. The left shoulder presenting; the membranes unruptured.
71. The back presenting; the liquor amnii evacuated.
72. Abdominal presentation.

Plate

73. Hand, foot, and funis presenting.
74. Shoulder presentation: to exemplify the spontaneous evolution.
75. Exvisceration.
76. Decapitation.
77. Placental presentation.
78. Partial placental presentation. Fig. 1, the membranes unruptured. Fig. 2, the membranes broken.
79. Placenta retained in utero after the child's birth. Fig. 1, globular contraction. Fig. 2, a part of the fibres of the fundus contracted round a portion of the placenta. Fig. 3, hour-glass contraction.
80. The funis prolapsed by the side of the head.
81. Hand prolapsed by the side of the head.
82. Monstrosity. Two fœtal bodies joined together by the sternum and abdomen.
83. Monstrosity; with two heads, four arms, and two legs.
84. Twins in utero: the head of one presenting, the breech of the other.
85. Secondary fœtus of three months age.
86. Retroversion of the uterus.
87. Ovarian, extra-uterine pregnancy.
88. Parietal, extra-uterine pregnancy.
89. Diseased ovum, of seven weeks age.
90. Healthy ovum, of fourteen weeks age.

INSTRUCTIONS TO THE BINDER.

◆

Plate		Page
1	To face	1
2	Ditto	10
3	To follow immediately after.	
4	To face	12
5	Ditto	16
6	To follow plate 5.	
7	Ditto plate 6.	
8	To face	22
9	Ditto	26
10	To follow plate 9.	
11	Ditto plate 10.	
12	To face	28
13	To follow plate 12.	
14	To face.	34
15	Ditto	36
16	Ditto	40
17	Ditto	48
17A	Ditto	50
18	(The etching, with references, immediately to precede it) to face	52
19	To follow plate 18.	
20	(The etching, with references, to precede it) to face	54
21	To face	56
22	Ditto	60
23	Ditto.	62
24	To follow plate 23.	
25	To face	64
26	Ditto	68
27	Ditto	80
28	Ditto	84
29	Ditto	88
30	To follow plate 29.	
31	To face	90
32	To follow plate 31.	
33	To face	106
34	Ditto	108
35	To follow plate 34.	
36	Ditto plate 35.	
37	Ditto plate 36.	
38	To face	114
39	To follow plate 38.	
40	Ditto plate 39.	
41	Ditto plate 40.	
42	To face	124
43	Ditto	194
44	To face	198
45	To follow plate 44.	
46	To face.	200
47	Ditto	204
48	Ditto	226
49	Ditto	228
50	Ditto	230
51	Ditto	254
52	Ditto	272
53	Ditto	274
54	Ditto	276
55	Ditto	286
56	Ditto	300
57	Ditto	310
58	Ditto	312
59	To follow plate 58.	
60	To face	334
61	Ditto	340
62	Ditto	342
63	Ditto	344
64	To follow plate 63.	
65	To face	346
66	To follow plate 65.	
67	To face	348
68	To follow plate 67.	
69	To face	354
70	Ditto	362
71	Ditto	364
72	Ditto	366
73	To follow plate 72.	
74	To face	382
75	Ditto	384
76	Ditto	386
77	Ditto	400
78	Ditto	426
79	Ditto	445
80	Ditto	512
81	Ditto	518
82	Ditto	522
83	To follow plate 82.	
84	To face	526
85	Ditto	532
86	Ditto	648
87	Ditto	662
88	Ditto	666
89	Ditto	688
90	To follow plate 89.	

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OBSTETRIC MEDICINE AND SURGERY.

OF THE PELVIS.

Before the mechanism of parturition can be understood, it is necessary to describe the organs subservient to the process, and with this view the bony pelvis first offers itself to the attention.

The term *pelvis* is applied to that mass of bones which, placed at the bottom of the spinal column, and resting on the inferior extremities, connects the thighs with the upper part of the trunk. When divested of its soft structures, this organ somewhat resembles a basin, and hence its name; for the Greeks called it πέλυξ, a wooden utensil of bowl-form, used for domestic purposes; the Latins from them derived the word pelvis, which we have adopted. In many of the older anatomical works it is described as "the basin," but all the recent authors have preferred the more classical appellation of pelvis.

Division of the Bones of the Pelvis.—In the adult state it is composed of four bones, two *ossa innominata,* which form the parietes at the sides and in the front; the *os sacrum* and the *os coccygis,* which bound the cavity behind. But until the age of childhood is considerably advanced, many points of ossification are observed in each of these bones, separated by intervening portions of cartilage; these cartilaginous septa are gradually absorbed as growth advances, and ossific matter is deposited in their stead; so that one solid bone is formed of what originally consisted of many pieces.

This arrangement is particularly remarkable in the OS INNOMINATUM,* which during the period of infancy is divided into three distinct parts. In describing the os innominatum, therefore, anatomists have preserved the distinction of these separate bones, marked out in early life; and demonstrate it as though it still consisted of the three original portions. To the superior division they give the name of *os ilium* (¹); to the inferior that of *os ischium* (²); and to the anterior that of *os pubis* (³).

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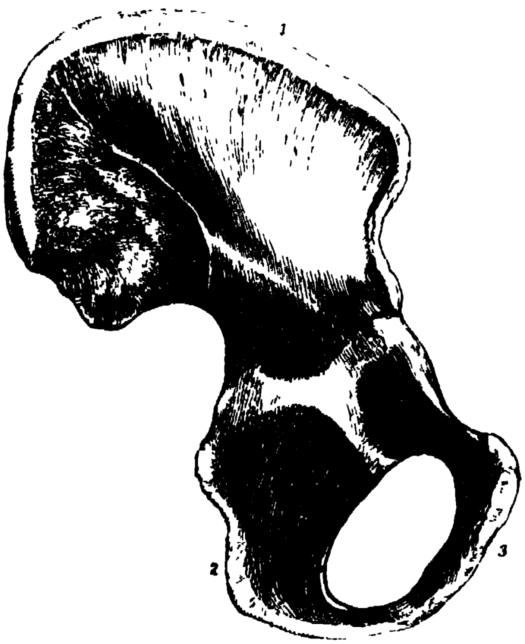
* This bone is generally said to have obtained its name from its shape being so irregular that it could not be likened to any object in nature. (Quain, Campbell, and others.) It is more probable, however, that it originated in the fact, that no specific term was applied to it for long after it had been described in medical writings. Its three constituent parts had each a special designation, but when they grew



The white lines in the accompanying cut, drawn from the os innominatum of the left side, distinguish with sufficient clearness the natural division of the bone in the young subject.

The two next cuts represent the left os innominatum of the adult. The first gives a view of the outer, the second of the inner surface.

The OS ILIUM, HIP OR HAUNCH BONE, is the largest of the three divisions of the os innominatum; and it is uppermost in position. It is remarkable for some peculiarities, which, in an obstetrical point of view, as well as anatomically, are worthy of consideration. It has an outer and an inner surface; the outer is called dorsum (*a*), and may be said to be irregularly convex: it is marked by eminences and depressions indicative of the attachment of the three powerful glutæi muscles. The chief extent of the inner surface is concave and smooth, and is called the venter. The lower portion, the base or body, is the thickest part of the bone, and enters largely into the composition of the acetabulum (*b*), a cavity for the reception of the head of the femur,—in conjunction with which it forms the hip joint. Just above the base the bone narrows into a kind of neck, from which springs the *ala* or *wing* (*a*), rising obliquely upwards, out-

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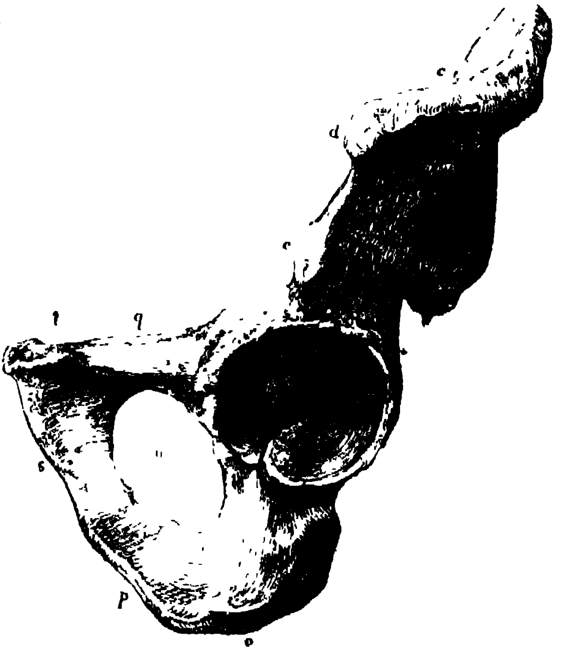
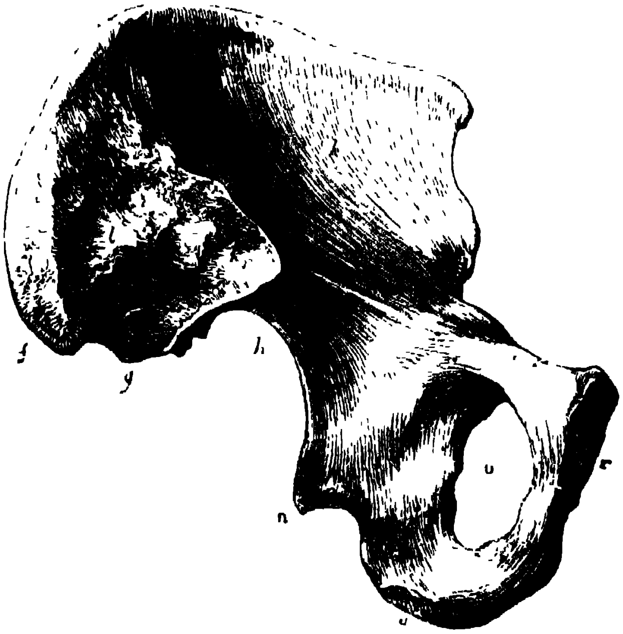
together, the entire piece was left nameless. Hippocrates, indeed (De Articulis, lib. iii. cap. 41), speaks of it as *μέγας σπονδύλος*, "the great vertebra," very incorrectly; for although Monro states, that by this phrase Hippocrates signified the sacrum, any one who reads the passage, *'Απὸ μὲν τοῦ ἱεροῦ ὀστέου ἄχρι τοῦ μεγάλου σπονδύλοὸ παρὰ ὃν προσήρτηται τῶν σκελέων ἡ πρόσφυσις*, &c., *but from the sacrum, as far as the μέγας σπονδύλος, into which the thigh-bones are articulated*, must be satisfied he meant by it the os innominatum. Celsus (lib. viii. cap. 1) calls it the os coxarum, which defines nothing; but after him we find Galen (Com. in Hip. lib. De Ossium Natura, cap. 20) using the following words in respect to these two bones, *μηδὲν ἐφ' ὅλων ἑαύτων ὄνομα κείμενον ἔχοντα*, although their different component parts, the ilium, ischium, and pubis, had each a distinct title; yet *no name had been allotted to them as a whole*. It therefore obtained the contradictory appellation, *os innominatum*, or bone without a name.

wards, backwards, and forwards, to protect and support the lower abdominal viscera. The ala terminates superiorly in a ridge, running along its whole extent, called the *crista ilii, crest* or *spine* of the *ilium* (*c*). This ridge is tipped with a deep layer of cartilage in the child, as is shown in the first cut. To different parts of the crest are attached the oblique and transverse abdominal muscles, the latissimus dorsi, the erector spinæ, and the quadratus lumborum. The crista ilii ends both anteriorly and posteriorly in a jutting prominence, to which the term spinous process is applied; beneath each of these prominences there is a slight sinuosity; and below them, again, another jutting point of bone, also called spinous process: so that there are four spinous processes belonging to the ilium; an anterior superior (*d*), an anterior inferior (*e*), a posterior superior (*f*), and a posterior inferior (*g*). From the anterior powerful muscles take their origin. The anterior superior spinous process gives attachment to one end of Poupart's or Gimbernat's ligament; to the tensor vaginæ femoris, and the sartorius muscles. From the anterior inferior arises the longer portion of the rectus femoris. Into the posterior are inserted strong ligaments, which bind this bone most firmly to the sacrum. Below the posterior inferior spinous process there is a considerable sinuosity or arch, forming, when the bone is joined to the sacrum, a very large notch: this is called the sciatic notch (*h*). But in the recent pelvis this notch is perfected into two foramina—an upper





one, the larger, and a lower one, the smaller—by ligaments hereafter to be described, which run from the side to the back part of the pelvis; and, therefore, when the ligaments are preserved, these apertures are called the sciatic foramina. (Plates 2 and 4, figs. 2.) Through the larger of these pass the gluteal, sciatic, and pudic arteries, the sciatic and pudic nerves, and the pyriform muscle. Through the smaller the pudic arteries and nerve re-enter the pelvis, and the obturator int. muscle passes out.

That portion of the internal face of the ilium (fossa iliaca), which is smooth and concave (*k*), supplies a bed for the reception of the iliacus internus muscle; but the posterior part (*l*) is very rough, and marks the connection between the ilium and the sacrum. This union forms one of the two *sacro-iliac symphyses,* or posterior joints of the pelvis, there being one on each side of the sacrum. Between the ilium and sacrum, at this junction, is interposed a piece of fibro-cartilage, about a sixth or eighth of an inch in thickness, so that the bones are separated to that extent; and it is invariably remarked, provided the joint is healthy, that, when the ligaments are cut, and the two bones forcibly wrenched asunder after death, the cartilage adheres to the sacrum, leaving the ilium denuded. In structure it is more like the intervertebral substance than any other tissue of the body: it is arranged in concentric layers, and is softer towards its posterior edge than in the front. The object of this soft elastic pad being situated in this place is evidently to break the shock, and prevent the jarring sensation which must otherwise have been experienced in the violent actions of the body, such as running and leaping; and it may also act as a [illegible]ent in glueing the bones together. Traversing [illegible] face horizontally, there is a ridge, which [illegible] from the lower part (*m*), and which is more evident in the entire pelvis, forming a portion of the *pelvic brim, linea innominata,* or *linea ilio-pectinea.* (Plate 3, fig. 1.)

The ilium is connected with the ischium and pubis in the acetabulum, and with the sacrum by means of the sacro-iliac symphysis.

Second in size and lowest in position of the three divisions of the os innominatum, is the OS ISCHIUM, OS SEDENTARIUM, or SEAT BONE, so called from being that portion of the bone on which we rest when sitting. It is remarkable for a *base* or *body, a spinous process, its tube[illegible],* and *ascending ramus.* The base is the thickest part, and assists even more largely than the base of the ilium in the formation of the acetabulum. Immediately below the base there is a narrowed portion that may be called the *neck:* and arising from the posterior part of the neck, jutting backwards and inwards, there is a thin pyramidal process, somewhat like the point of a lancet, to which the appellation of *spinous process* (*n*) is given. This affords attachment to one fasciculus of the sacro-sciatic or sacro-ischiatic ligaments, and gives origin to the coccygeus muscle, which is inserted into the coccyx, to raise that bone. This spinous process is an object of more intense interest to the obstetrician than its small size would lead us to suppose; because it is sometimes of undue length, or is bent too much inwardly. By such a construction, the capacity of the outlet is materially encroached upon and diminished, and, in a proportionate degree, the passage of the child's head in labour is retarded. In its descent downwards from the neck, the bone bulges out into a considerable protuberance, the *tuber ischii*, or *tuberosity of the ischium* (*o*); and rising obliquely upwards, forwards, and inwards, a flat, narrow sheet of bone extends, to meet, and, as it were, to be fused with a similar piece of bone sent down from the pubis,—the *ramus of the ischium* (*p*). This bone is also rough externally and smooth within; to the lowest part of the tuber is attached one end of the other fasciculus of the sacro-sciatic ligament: whilst the outer portion gives origin to the semi-membranosus, semi-tendinosus, the long head of the biceps flexor cruris, and the quadratus femoris muscles. The ischium is connected with the ilium and pubis in the acetabulum, and with the pubis at the junction of the rami: it is firmly connected also with the sacrum; not by direct apposition, or bony union, but by means of the ligaments just mentioned.

The smallest of the three divisions of the os innominatum is the OS PUBIS, PECTEN, OR SHARE BONE, situated anteriorly. It, like the ilium [illegible] possesses a *base* or *body*; it has two rami, a *horizontal* [illegible] *ramus*, a *spinous process*, and a *symphysis*. The base is its [illegible], and contributes, but in a small proportion, to form the acetabulum. Just anterior to the base there is a contracted part, the neck, and running horizontally forwards and inwards, so as to meet its fellow of the opposite side, a thin, narrowed piece of bone is thrown out—the *horizontal ramus* of the pubis (*q*). This terminates in a wider sheet, and its edge, the point of junction with its fellow bone, is called the symphysis pubis (*r*): it is the anterior joint of the pelvis. The pubic bones are not, however, in contact, here; for there is a considerable thickness of the same kind of cartilaginous matter placed between them, as is found at the sacro-iliac symphyses. Some anatomists have affirmed that there is a double joint, one on each side of the central cartilage; others, that there is only one; and others again, that although occasionally an imperfect synovial membrane may be seen, by far most frequently neither can a cavity be detected, nor any apparatus indicative of the presence of a joint: and this latter seems to be the idea of the best anatomists of the present day. From the thickness of the interposed substance, a slight lateral motion may possibly be allowed to the bones, even in the healthy state of the parts; but the strength of the ligaments, both within and without, would prevent any considerable movement. Proceeding from the symphysis, in a direction downwards, outwards, and rather backwards, to be joined by ossific union with the ramus ischii, there is another flat, thin, and narrow sheet of bone—*the descending ramus of the pubis* (*s*). This bone is, like the other two, rough externally, and smooth within: from the outer surface some of the adductor muscles of the thigh take their rise. On the interior, running along the upper margin of the horizontal ramus, there is a ridge, sometimes rather sharp, which is a part of the brim of the pelvis, and at its inner extremity it terminates in a little eminence—the *spinous process* (*t*). To this is attached the pubic end of Poupart's ligament, near it the pectineus; the oblique and transverse muscles, the pyramidalis, and rectus abdominis, are also inserted into different portions of the upper edge of the pubis. The pubis is connected with the ilium and ischium in the acetabulum, with the ischium at the junction of their rami, and with its fellow bone of the opposite side, by the symphysis.*

When the os innominatum is again regarded as a whole, the attention cannot fail to be arrested by a large oval aperture in the fore part, formed by the ischium and pubis—the *thyroid* or *obturator foramen* (*u*). In the recent pelvis it is almost entirely filled up by the obturator ligament, which consists merely of two layers of periosteum,—one externally, the other within,—continued from the bone across it. The space is entirely covered by this extension of the periosteum, except at the uppermost part, where a hole is left, not larger than would permit the passage of a small bougie: through it the obturator vessels and nerve escape from the pelvis. This ligament supplies the place of bone; for the obturator externus, one of the rotators of the thigh, arises from its outer surface. It appears to be placed here for the purpose of rendering this part of the body lighter than it would be, were a thick piece of bone present instead.

There is another point, in regard to these three divisions of the os innominatum, worthy the consideration of the obstetrician; namely, the relation which each bears to those parts of the pelvis, hereafter to be more particularly described,—the brim and outlet. The ilium forms a considerable share of the brim, but none of the outlet; the ischium forms a part of the outlet, but none of the brim; while the pubis enters very largely into the composition of both the brim and outlet: so that the ilium might be greatly deformed, and yet the brim alone suffer; a distorted ischium would only involve the outlet; but if the pubis were of vicious formation, both brim and outlet must necessarily be implicated.

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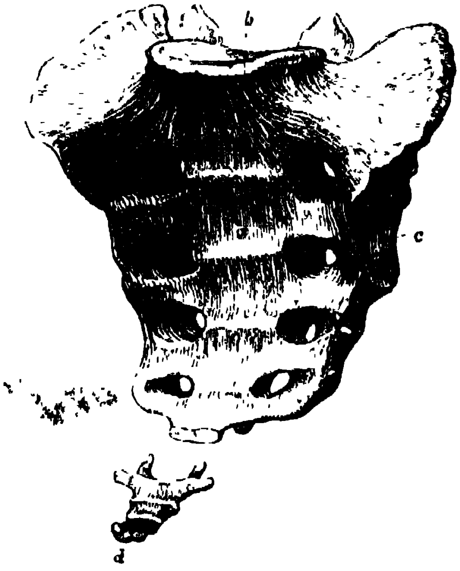
* The term *pubis* was applied to this bone in consequence of its intimate connection with the external organs of generation; and that of *pecten* from its fancied resemblance to a comb, when the two are united.

The pelvic cavity is bounded posteriorly by the *os sacrum, os basilare*, or *rump bone*, and the *os coccygis*, which are also called the *false vertebræ*.

The OS SACRUM,* OS BASILARE, is the largest bone in the vertebral column: in form it is triangular, the apex of the pyramid being placed downwards, and rather backwards; the base upwards, and inclined a little forwards. Its specific gravity is small; indeed, it is the lightest bone in the body for its size, and, consequently rather spongy in structure. It possesses four surfaces—an external, an internal, and two lateral. The accompanying figures display the inner face of the sacrum and coccyx:—



The external surface is convex and rough; and there are four, and sometimes five processes placed below each other in a perpendicular line, more strongly marked at the upper part of the bone, assimilated to the spinous processes of the vertebræ; they may therefore be called the *spinous processes of the sacrum*. The bone indeed appears, as it were, an imperfect continuation of the vertebral column; the peculiarities of the vertebræ becoming less evident, and dwindling away by degrees in the sacrum as they descend. Anterior to this series of processes, there is a cavity extending the whole length of the bone—a continuation of the spinal canal—for the reception of the *Cauda Equina*, which proceeds from the inferior portion of the spinal marrow. Four pairs of holes are seen, one on the side of each spinous process, communicating with this canal; these are for the transmission of small nerves from the cauda equina to the soft parts covering the sacrum and structures adjacent. Internally the sacrum is smooth,

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* For the probable origin of the term os sacrum, see Appendix A.

resembling in this respect the other bones of the pelvis, and concave. Four white lines, generally rather eminent, run horizontally across it, indicating the situation of the cartilage in early life, by which the bone was divided into five distinct pieces. There are also four pairs of holes within; one at the extremity of each of these white lines, for the transmission of the anterior sacral nerves, destined to form a large portion of the great sciatic nerve, as well as to supply the organs contained within the pelvis. The concave plane—the *cavity* or *hollow* of the sacrum (*a*)—varies in regard to the segment of the circle which it forms in different individuals; and if it be too straight, or too much curved, it will equally impede the ready passage of the child's head in labour. The centre of the upper edge of the bone projects forward; so that in its natural position this part looks somewhat over the cavity, and diminishes the space at the brim. This is called the *prominence* or *promontory* of the sacrum (*b*). On it the last lumbar vertebra rests, a portion of intervertebral substance being placed between them; and it supports the whole weight of the trunk, head, and superior extremities. When the brim of the pelvis is distorted, the irregularity of shape is almost always attributable to the prominence of the sacrum, together, perhaps, with the last lumbar vertebra being thrown too far forwards, and too closely approaching the pubes. The entrance to the cavity is thus preternaturally constricted; and the diminution of space in this way produced is one of the most common causes of lingering labour met with in this city.

The lateral surfaces (*c*) are very rough, and correspond in extent and irregularity with that part of the inner face of the ilium which forms the sacro-iliac symphysis or synchondrosis.

This bone is connected at its upper part with the last lumbar vertebra, through the intervention of a layer of intervertebral substance, with the coccyx below, by a moveable, ginglimoid joint, and with the ilium on each side by the sacro-iliac symphyses. It is also connected with each ischium by the sacro-sciatic ligaments.

The os COCCYGIS[*] (*d*) appears like a continuation of, or an appurtenance to, the sacrum; but it is of much importance in obstetrical study. It was denominated coccyx from its resemblance to the beak of the cuckoo.[†] It is, therefore, as the name would imply, in shape hooked and pyramidal: the base is placed upwards, the apex below. The bone is divided into three, and sometimes four, distinct portions, which play upon each other, backwards and forwards, by separate joints. Externally it is convex and irregular, concave and smooth within, and terminates in a tapering point, which is bent forwards in the ordinary state of the parts to support the lower end of the rectum.

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[*] Κόκκυξ, a cuckoo.

[†] The Cuculus, or cuckoo, is a genus of the order Picæ, in which the raven and jay are also included.

The coccygeal joints are of great value in the process of labour. Their mobility much facilitates the exit of the head, by enlarging the outlet of the pelvis in the antero-posterior direction. The increase of space thus gained amounts to an inch or more; for the point of the bone may be bent backwards to a line continuous with the sacrum, or even beyond, so as to form an angle outwards (plate 4, fig. 2, *a*, *b*).

Occasionally, indeed, the coccyx becomes ankylosed to the sacrum, and its own joints also are destroyed by a deposition of osseous matter between the separate pieces, so that their mobility is lost, and the bone becomes, as it were, a portion of the sacrum itself. Such a consolidation must offer a considerable impediment to the expulsion of the head, by contracting the pelvic outlet: and this, though a rare, is therefore another cause of lingering labour. It is most usually met with in women bearing a first child late in life, and those who have been accustomed to sit through the principal part of the day, as is the case with milliners.

When the coccyx is in this state, it will sometimes break in labour: this may happen as well during a strong, unaided uterine contraction, as under the employment of instruments. The occurrence of such an accident may be known,—perhaps, by the attendant being sensible of the part having given way, while his hand was employed protecting the perineum;—and perhaps by his hearing the noise peculiar to bones when fractured. I have seen three cases in which the bone broke, or the ankylosed joint gave way; in none of these did any permanent injury ensue. There was some pain and inconvenience for a time, but eventually re-union was effected, and the distress occasioned was inconsiderable. The best mode of treating such a mischance would be to keep the patient in a state of perfect rest, to interdict her lying on her back, to prevent, if possible, any external pressure on the part, and to keep the bowels moderately open. On the one hand, the frequent evacuation of the rectum, by causing almost constant movement of the fractured portions one upon the other, would interfere with ossific union: and, again, if the lower bowel became filled with hardened fæces, their expulsion would probably disturb whatever degree of reparation might have been procured. Thus, both extremes of immoderate action and excessive constipation must be avoided. In the management of the patient, not only should our object be directed towards obtaining a consolidation of the separated ends, but we should also endeavour to preserve the coccyx, as nearly as we can, in a continuous line with the sacrum; for it is evident that if the junction take place while the point of that bone is directed greatly forwards, the size of the pelvic outlet will be lessened in the same degree; and in any subsequent labour a proportionate difficulty will necessarily exist. The coccyx is called vernacularly the *huckle* or *knuckle*, and sometimes the *whistle-bone*.

Form and Dimensions of the Pelvis.—When we examine the pelvis with reference to labour, we must attend not only to its figure, but also to its dimensions, and the bearings which its axes hold in regard to each other, and to the trunk of the body. We observe that it is formed on the principle of the double arch, which structure in architecture possesses the greatest possible degree of firmness that can be devised for the quantity of material employed. So that the pelvis combines, to an eminent extent, the qualities of strength and lightness.

Anatomists distinguish the pelvis into two grand divisions, the *true* and the *false pelvis*, considering the *alæ ilii* to constitute the false portion. The alæ ilii, however, are of trifling interest to us as obstetricians; for, unless the organ be inordinately distorted, they have little or no influence over the process of parturition, being quite out of the way of the head's descent. Obstetrically it is divided into the *brim*, or superior aperture (plate 3, fig. 1); the *outlet*, or inferior aperture (fig. 2); and the *cavity*, all that is embraced between these two; and the peculiarities belonging to each of these parts offer themselves next for observation.*

In demonstrating the shape and size of the female pelvis, it is the custom not to describe any particular specimen which we may happen to possess, but to assume a model of perfection, which we consider *the standard*; so symmetrically formed, as would most com[illegible] answer all the [illegible] that nature has assigned to it.

THE BRIM somewhat [illegible] in shape, has necessarily two diameters,—the longest from side to side—the shortest, in the centre, from before backwards. The regularity of the oval is broken, principally by the jutting forwards of the sacral promontory (plate 3, fig. 1, *a*), so that the outline represents, in some measure, the heart, as painted upon playing cards. But this resemblance is stronger in the male, than in the pelvis of the opposite sex, because the longest diameter in the male pelvis is antero-posteriorly (plate 2, fig. 1), while in the female, as just shown, it is laterally (fig. 2).

The *lateral, transverse*, or *iliac* diameter, measures five inches and a quarter (plate 3, fig. 1, *c d*); the *antero-posterior, sacro-pubic*,

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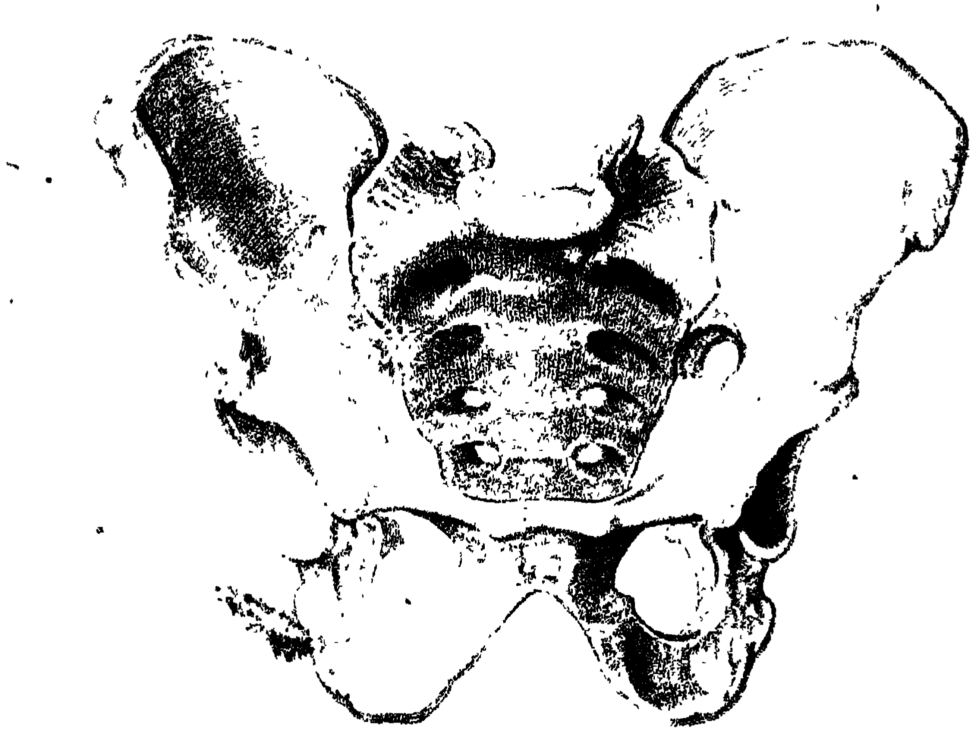
* The brim is sometimes called the *superior straight*, or *upper floor* of the pelvis, as the outlet is sometimes called the *inferior straight* or *lower floor*. By the planes of the pelvis are meant imaginary floorings, which might be fitted into the pelvis at different parts of its depth. Thus the plane of the brim would be encircled by the *linea ilio-pectinea*, and the plane of the outlet, by the structures forming the boundary of that aperture.



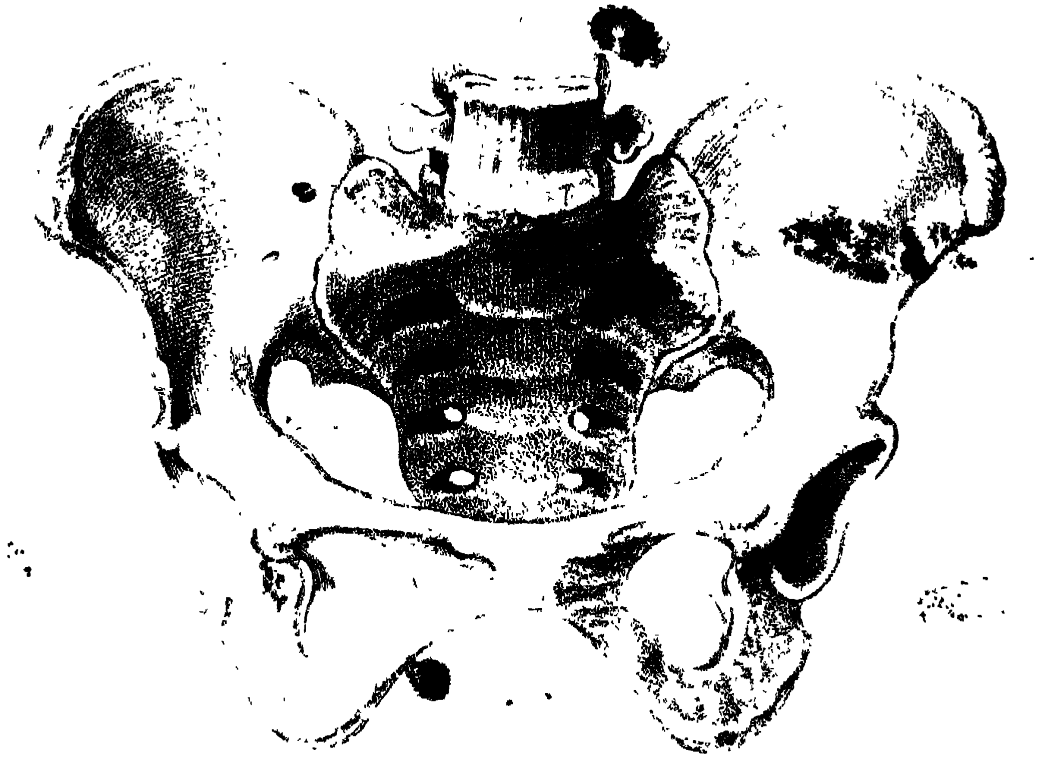
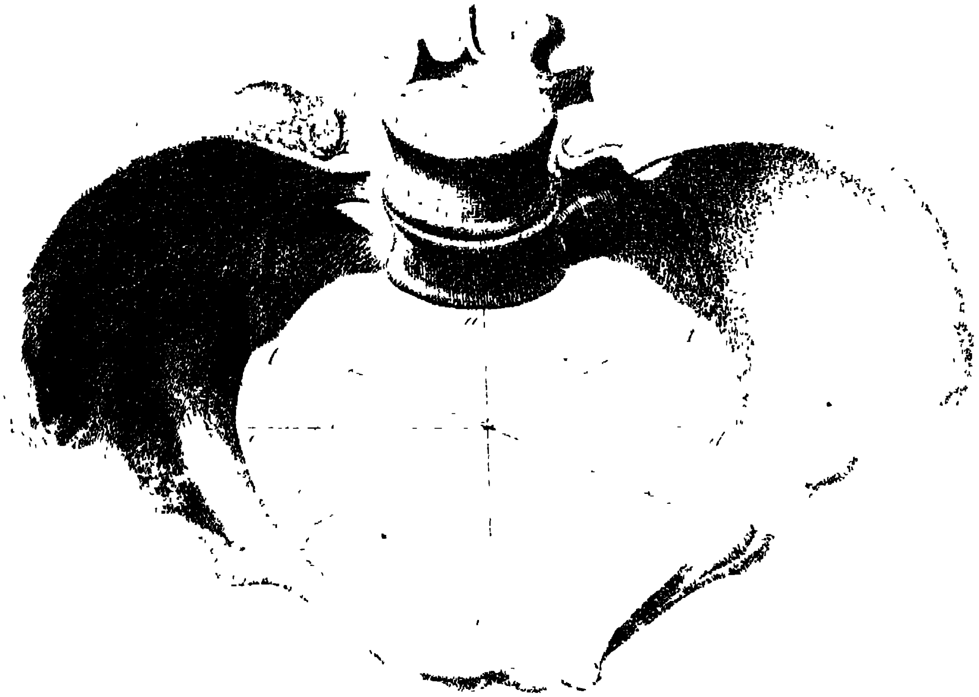


Fig. 1



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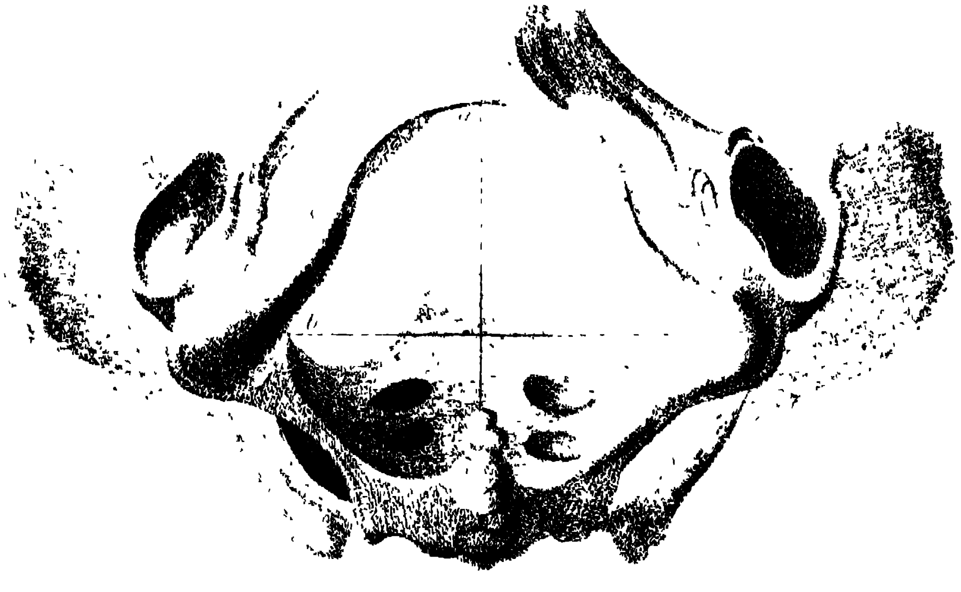
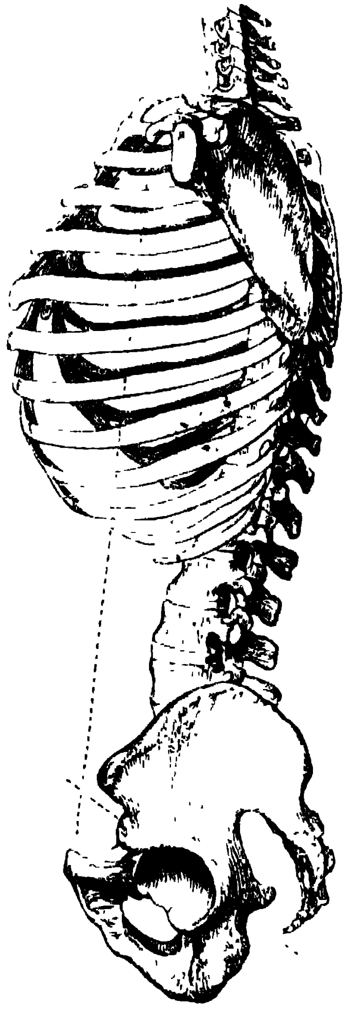


or *conjugate*, measures four (*a, b*); the two *oblique*, or *diagonal*, extending from the sacro-iliac symphysis to the ramus of the pubis, on the opposite side of the body (*e, f*), are nearly the same as the direct lateral, probably not so great by about a quarter of an inch. These admeasurements are, of course, considerably less in the reçent pelvis and the living body, in consequence of the room occupied by the soft structures: we must allow for their lodgment at least a quarter of an inch in the conjugate diameter, and nearly half an inch in the lateral, to which extent the available space in labour will probably be diminished.

It has been much disputed whether the iliac or the oblique diameter should be considered the longest; we shall find, I think, that in by far the greatest proportion of well-formed pelves, divested of the softer parts, the iliac measures most; but when the contents, linings, and muscles are preserved, the greatest space is along the oblique line.

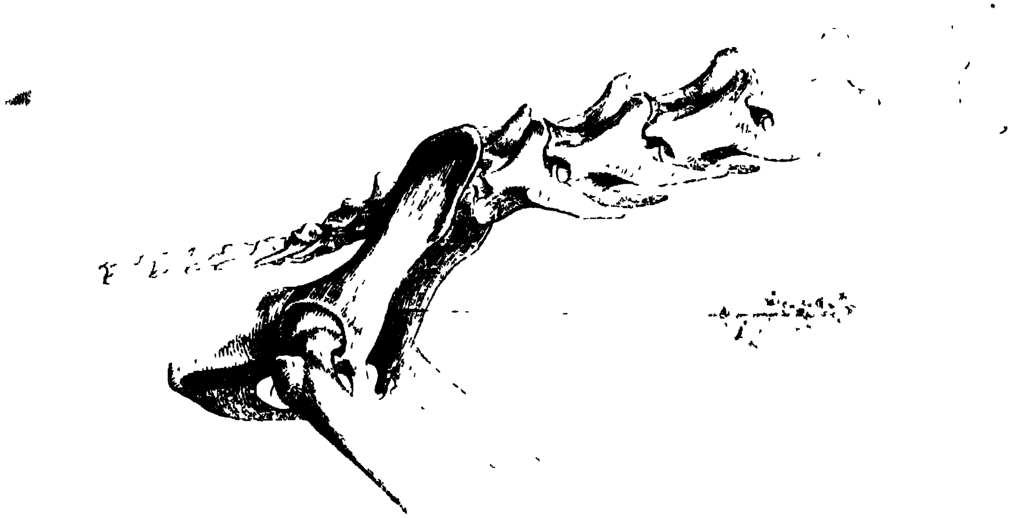


THE CAVITY is observed to be deep behind, shallow in front; and it becomes gradually shallower as we traverse from the back to the fore part. The greatest depth is from the sacral promontory to the tip of the coccyx, and should be from five inches and a half to six inches; at the side, from the lowest point of the tuber ischii to the brim, three inches and a half; and behind the symphysis pubis, one and a half (plate 4, fig. 2).

THE OUTLET is also inclining to an oval shape, but it is even of greater irregularity than the brim, owing principally to the projection of the tip of the coccyx behind, and to the large sinuosity in front, the arch of the pubes (plate 2, fig. 2; and 3, fig. 2, *a, b*). In extent the diameters of the outlet are nearly the same as at the brim; in situation they are reversed. Thus the long diameter is from before backwards, in a line extending from the point of the coccyx to the under edge of the symphysis pubis (plate 3, fig. 2, *a*); and when the bone is pressed back in labour, this measures five inches or more; although, in the ordinary state of the parts, the extremity being directed forwards, its utmost extent is only four. The short diameter extends laterally from the tuberosity of one ischium to that of the other, is incapable of being increased, and measures four (*b*).

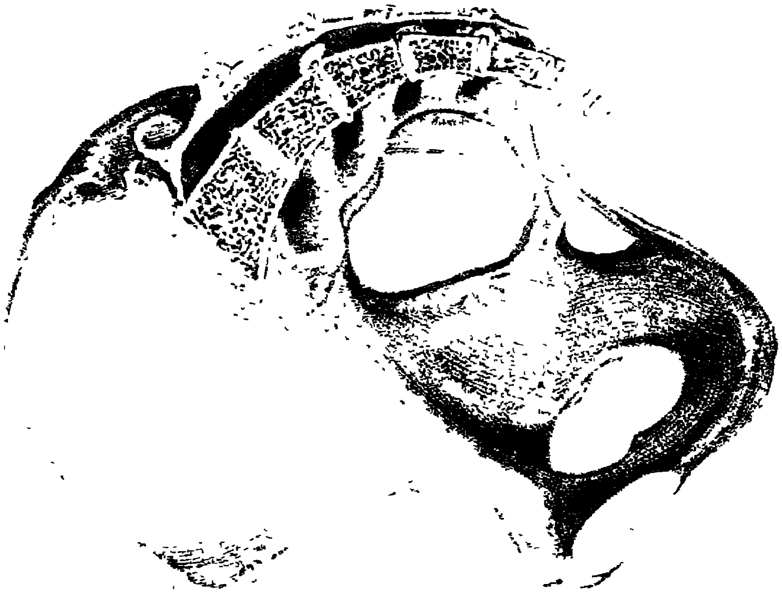
The outlet is bounded by the tip of the coccyx at the back, by the lower edge of the under fasciculi of the sacro-sciatic ligaments posteriorly and laterally, by the tuberosities of the ischia at the side, by the rami of the ischia and pubes anteriorly and laterally, and by the symphysis pubis in front.

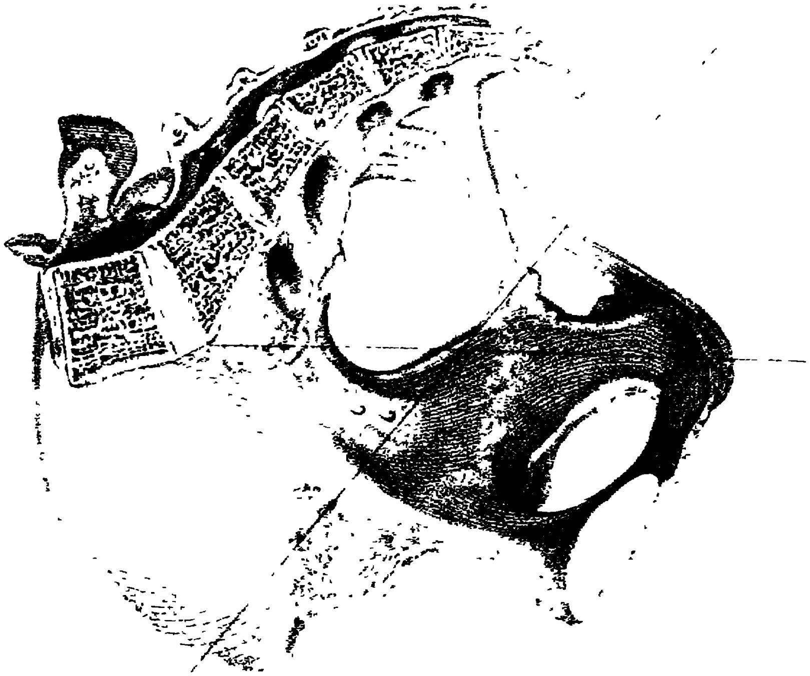
The position of the pelvis in regard to the trunk of the body, is neither perpendicular to the horizon, nor horizontal, but oblique, the sacral promontory being raised considerably above the level of the pubes; so that a line drawn through the trunk in a direction of its axis, would, in falling downwards, strike on the centre of the symphysis pubis. It is by resting on this bone that the uterus is supported during the latter months of pregnancy. Were the axis of the trunk and pelvic entrance in the same line, owing to the upright position of the human female, the womb, towards the close of gestation, would gravitate low into the pelvis, and produce most injurious pressure on the contained viscera: while, in the early months, not only would the same distressful inconvenience be occasioned, but there would be great danger of its protruding externally, and appearing as a tumour between the thighs, covered by the inverted vagina. In the quadruped, since the impregnated uterus is entirely supported by the abdominal parietes, the effects of gravity on the pelvis need not be counteracted; and we therefore find that, in consequence of the lumbar vertebræ being slightly arched upwards, the axes of the trunk, brim, and outlet, are placed nearly in a continuous line.



In the first cut, the two lines mark the axes of the trunk and pelvic entrance in the human subject. In the second, a single line runs entirely through the trunk and pelvis. The drawing from which this cut was made was taken from the skeleton of a cat.

The pelvis itself has also two axes, one of the brim, which is





downwards and backwards, following a direction from the umbilicus to the coccygeal extremity of the spinal column; and the other, of the outlet, which is downwards and forwards, from the promontory of the sacrum to the central space between the tuberosities of the ischia; so that a line drawn through the brim, in the direction of the axis of the brim, would cross, at a considerable angle, another line drawn in the direction of the axis of the outlet (plate iv. fig. 2).* By a knowledge of the axes of the trunk and pelvic entrance, we can place our patient under labour in the posture most favourable to the easy descent of the fœtal head through the brim into the cavity; this is on the side (the left is usually chosen in this country), with the shoulders thrown forwards, the back bent into a curve, the thighs drawn up towards the abdomen, and the legs flexed towards the thighs. In this position the two axes are brought more nearly into one line than in any other, and the head is directed more completely over the centre of the brim. It is equally necessary, or even more so, to keep strictly in mind the relation that the two axes of the brim and outlet bear to each other; and this especially while performing any obstetrical operation. When using the forceps, for example, should we neglect this most essential precaution, we shall not only, in all probability, be foiled in accomplishing delivery, but we shall run the almost certain risk of inflicting irreparable injury on the woman.

Joints and Ligaments of the Pelvis.—Besides the joints proper to the coccyx, the pelvis possesses three others already mentioned;—one uniting the pubic bones in front, the symphysis pubis—and one on each side of the sacrum, connecting that bone with the ilia, the sacro-iliac symphyses, or synchondroses. These articulations are bound together by exceedingly strong unyielding ligaments, as well within as externally. The ligamentous expansions on the interior of the pelvis are much thinner than those on the outside; and although they assist greatly in strengthening the connections of the bones, they occupy but little space, and consequently do not encroach, in any considerable degree, upon the room required by the head in labour.

In addition to the ligaments belonging to the joints, there are the *obturator* ligaments, filling up almost the whole of the obturator foramina; and the *sacro-sciatic*, or *sacro-ischiatic* ligaments, of much interest to the obstetrical student. These run in two fasciculi on each side, the lower obliquely upwards, and backwards from the base of the tuber ischii to the side of the sacrum, and the other horizontally backwards from the spinous process of the ischium to the lower part of the sacrum and the coccyx: and both are widely spread on the outside of the last-named bones like a fan (plate 4). They tend, in a great degree, to render the outlet of the pelvis firm, by connecting together the sacrum and the ischia. They partake of the relaxation which the soft structures undergo in labour, and a preternatural rigidity existing in their fibres is occasionally a cause of retardation in the process.

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* Plate iv. fig. 1. shows a section of the male skeleton pelvis; fig. 2, the same of the female. The description of the pelvic axes might be given in a more simple and perhaps more correct way, by saying that they are lines drawn perpendicularly to the centres of the respective planes.

Separation of the Joints of the Pelvis during Labour.—It was for many centuries the prevalent opinion that the bones of the pelvis always separated,—or were disposed to separate, if occasion required it,—during parturition, especially at the symphysis pubis; and that they thus allowed the pelvic dimensions to be increased in every direction. This idea was rendered more probable by analogy; for it is said that in some animals, as the cow, the bones are absolutely disunited to some extent; and that the sinking of the sacrum, occasioned by its own weight and by the softened condition of the ligaments, together with a difficulty in progressive motion, is an indication of the near approach of parturition. Such a separation may possibly take place in the lower animals, but it is certainly not usual in the human subject. The joints are liable, indeed, to inflammation; and pus being secreted between the bones may occasion disunion—a disease attended with high constitutional excitement, and no small danger.* Sometimes, also, an actual separation of the bones occurs, both during pregnancy and after labour, from simple relaxation of the ligaments; which state gives rise to pain in the part deranged, and an inability to walk or stand without artificial support. This affection, though not attended with so much suffering or hazard as acute inflammation, is nevertheless of a very distressing character, and very difficult of cure; commonly confining the patient to bed or the sofa for many months. But it would be travelling too far out of the limits of this publication to enter minutely into the history of these diseases; and it is sufficient for our present purpose to know that, in the great majority of cases, there is no sensible relaxation of the pubic or sacro-iliac ligaments; that in others a softening does occur in various degrees, and that, when that change reaches such a point as to be attended with pain or inconvenience, it must be considered as morbid.

Difference in form between the Male and Female Pelvis and Skeleton.—On comparing the male (plate 2, fig. 1) and female pelvis (fig. 2) together, we cannot but remark a striking difference in the general appearance and particular porportions of this organ in the two sexes. We observe that the pelvis of the female is altogether larger and more delicately shaped than that of the male; that the alæ of the ilia spread themselves widely in the lateral direction; while the same parts in the male rise more perpendicularly upwards. The brim is differently shaped; the long diameter in the female being from side to side; in the male from before backwards. The cavity is considerably smaller in the male, deeper, more of a funnel shape, the sacrum being much narrower, and also straighter (plate 1, fig. 1); and the tuberosities of the ischia inclining closer together. The outlet is also far less capacious; and this arises principally from the approximation of the ischia, which seldom are more than three inches distant in the widest diameter. The arch of the pubes is formed more angularly than in the female, in whom this part approaches nearer to the perfection of an arch (plate 2, figs. 1 and 2). In the female, too, the rami of the ischia and pubes are smoother on their inner surface, and their anterior edge is turned more outwards. This disposition of the rami helps to enlarge the outlet, and gives an elegance to the whole organ that is wanting in the pelvis of the stronger sex.

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* See a paper by Dr. Huuter, Medical Observations and Enquiries, vol. ii. p. 321.

All the bones of the male skeleton are firmer and heavier than they are in the female, and more powerfully marked by those irregularities which indicate muscular attachments. The thoracic cavity is comparatively larger, and the acromia are at a greater distance from each other. A line drawn from the head of the humerus, perpendicularly downwards, would fall to the ground altogether clear of the pelvis; but in a well-articulated female skeleton, the same line would rest within the ala of the ilium. It is this difference that gives the broad shoulders to the male, and the swelling hips to the female, and occasions the principal distinction in the outline of the form between the sexes (plate 1, figs. 1 and 2).*

OF THE FŒTAL HEAD.

Shape and Dimensions of the Fœtal Head at Birth.—As both the brim and outlet of the pelvis present a form inclining to oval, so the fœtal skull is of a similar shape. It is, indeed, more perfectly oval; the long diameter, when the face is put out of calculation, being from the occiput to the forehead (plate 5, fig. 2, *a*, *b*); the short from the tuberosity of one parietal bone, to that of the other (plate 6, fig. 2, *a*, *b*).

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* These figures are sketched from Maygrier's work. It might perhaps be thought more desirable in some respects, if the characteristic difference between the male and female outline had been shown by drawings of the skeletons; but as the contrast by such a mode of illustration would not have been so strongly marked, I have preferred giving an etching of the full form. The elliptical lines will direct the eye to the principal points worthy of attention.

In extent, at birth, the long diameter measures four inches and a half, and the short three and a half; the circumference, drawn in a line over the ridge of the occipital bone, above the ears, and traversing the most prominent part of the frontal bones, is nearly fourteen inches. It must not be supposed that these measurements are exact or universal, any more than that the admeasurements given of the pelvis are always the same: but as we take a fancied standard pelvis as our guide, in the same manner we choose a standard head—such a one, perhaps, as is most commonly met with. I shall only mention one other diameter of the fœtal head, because, by multiplying such observations unnecessarily, the mind is distracted and the memory clogged; viz., that from the vertex to the chin, which is five inches and a half, capable, however, of elongation under labour, from the head being compressed laterally, to the extent of six and a half or seven inches.* The long diameter of the cranium, from the forehead to the occiput, being four inches and a half, and the short diameter three and a half, it follows that, when the head is properly adapted to the pelvis, a clear superabundant space of at least half an inch is left between the cranial and pelvic bones, both in the lateral and conjugate diameters, which is generally quite sufficient for the easy passage of the head.

Anatomical Peculiarities of the Fœtal Skull.—The general anatomical character, as well as the form and size of the skull, deserves our attention. It may be seen that the bones are not

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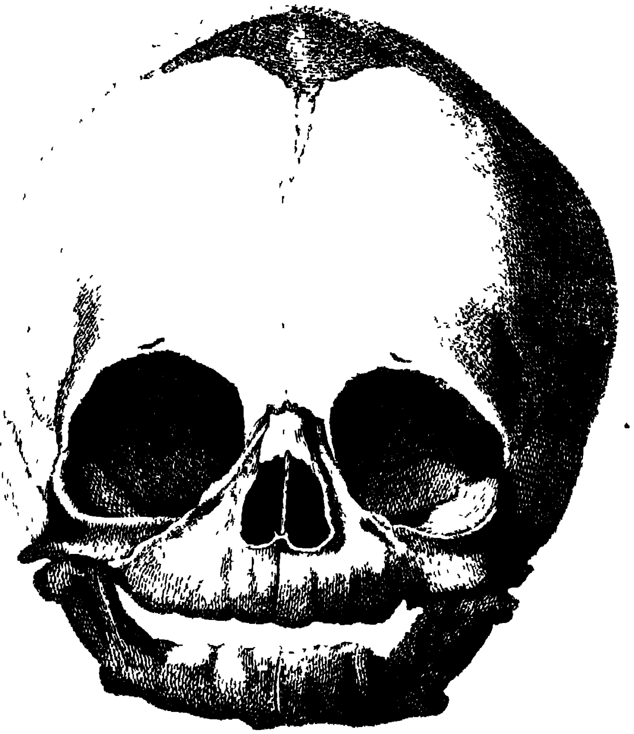
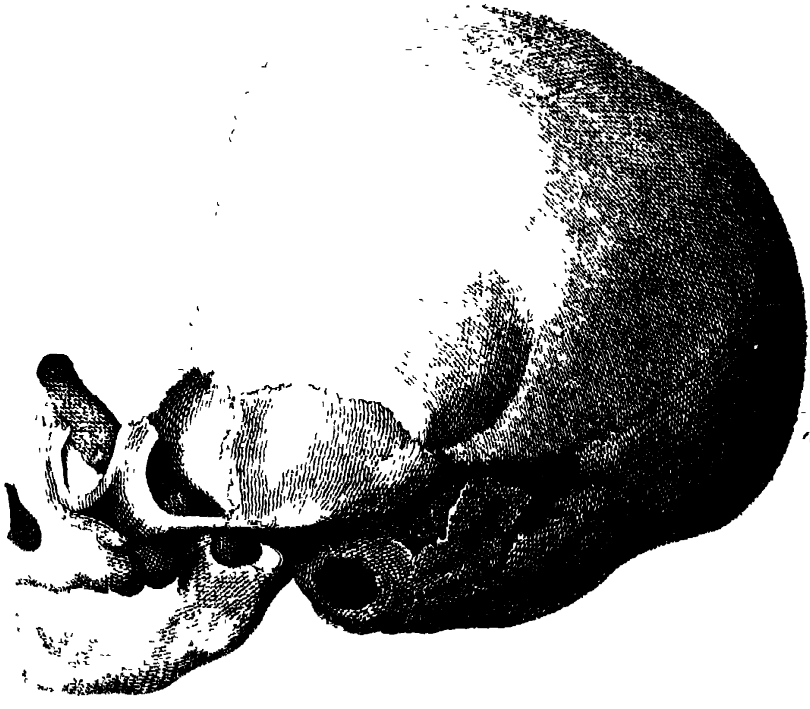
* It is generally remarked that the skull of the male child at birth is a little larger in all its diameters than that of the female. Of sixty male, and sixty female children, born at full time, Dr. Jos. Clarke found the average circumference of the head to be 14 inches in the males, 13⅝ in the females. The arch from ear to ear over the crown, was 7¼ in the males, 7 2/9 in the females. Or, if reduced to decimal figures, the difference will stand thus:—average circumference of the heads of male children 13·983, of female 13·617; difference 0·366: average dimension from ear to ear, male 7·429; female 7·221. So that the average circumference of the head in the male measures almost exactly three-eighths of an inch more than the female; and from ear to ear nearly one quarter of an inch more; consequently its transverse diameter is almost one-eighth of an inch longer. See the Foreign Quarterly Medical Review, vol. x. p. 492, for the measurements of the heads of 384 children, by Professor Thrulstrup, of Christiana, which singularly corroborate Dr. Clarke's calculations. Of the 120 examined by Dr. Clarke only six exceeded 14½ inches round, and all these were males.—*Second Letter to Dr. Price, Philosophical Transactions*, 1786, p. 358.

Professor Simpson, in an elaborate Memoir, published in the Edin. Med. and Surg. Journal for October 1844, adduces many facts to prove that both the parent and infant are exposed to greater danger, when the child is a male than when a female; and he attributes this entirely to the larger size which the head of the male is shown to possess over that of the female. Dr. Clarke also (loco cit.) says, his registry concurs with others in proving that nearly one half more males are still-born than females;—the average being 12 males to 7 females.

Fig. I





II

Fig 1

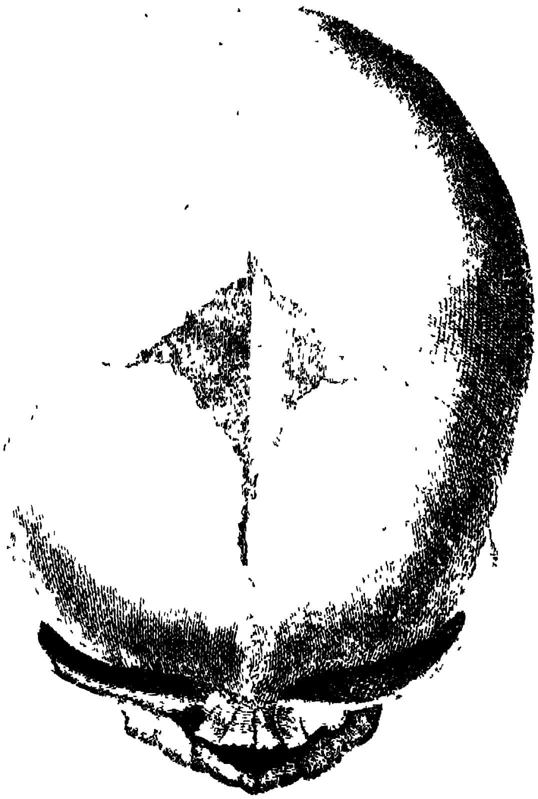
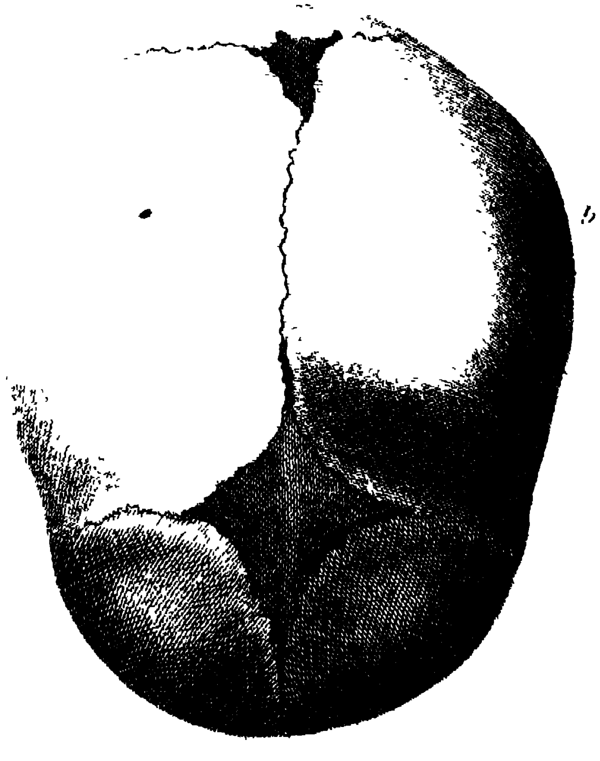
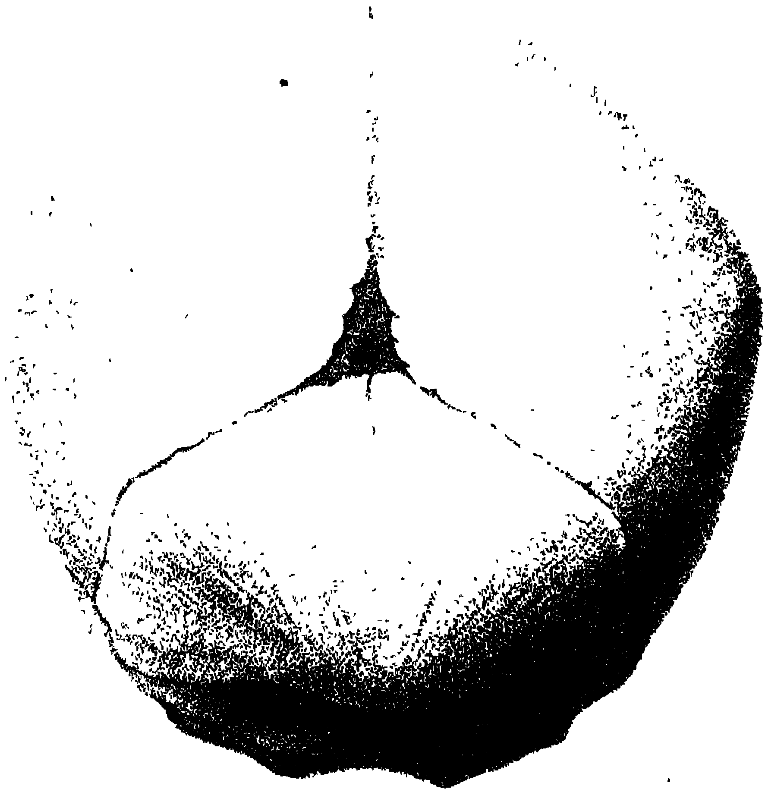
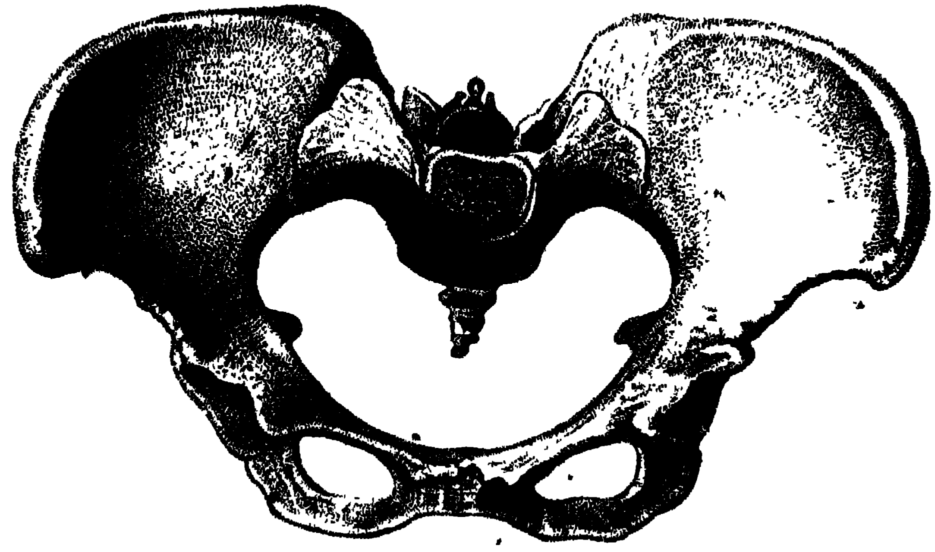
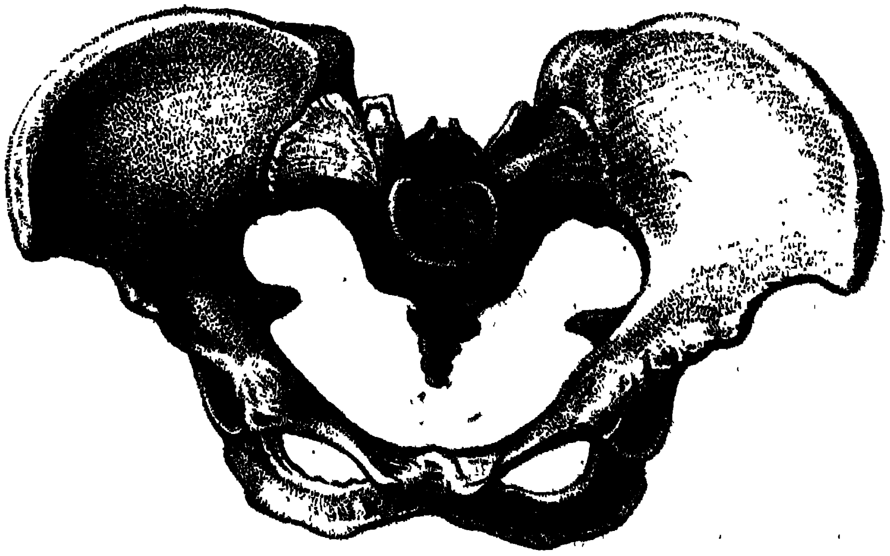


Fig 2









dovetailed into each other as in the adult, but are separated to some extent by intervening lines and spaces of membranous formation. The lines are termed *sutures*, from the Latin word *suo*, to sew; the spaces, *fontanelles*, after the French, because it used to be supposed that a moisture distilled from the brain through these unossified apertures. The fontanelle has also been called, bregma, from βρέχω, to moisten — the name having originated in the same idea.

The bones in the child's skull requiring our consideration obstetrically are but few:—the two *parietal* bones of a square shape, which give the principal protection to the brain laterally (plate 6, fig. 2, *a*, *b*); the *frontal* bone anteriorly (plate 5, fig. 1) — or rather the frontal bones, because, in the fœtus there are two;— and the *occipital* posteriorly (plate 7). The *parietal* bones are separated from the frontal, or connected with them, by a suture called *coronal* (plate 6, fig. 1, and plate 5, figs. 1 and 2), which runs from near the external angle of one eye to the same point on the opposite side of the head, bounding the forehead superiorly. It is called *coronal*, because the ancients used to wear their *coronæ* or garlands on that part of the head upon festive occasions. The parietal bones are separated from the occipital by a suture, termed *lambdoidal*, from its resemblance to the Greek letter Λ (plates 7 and 5, fig. 2). The two parietal bones are separated from each other by the *sagittal* suture (plate 6, fig. 2), which runs longitudinally along the centre of the upper part of the head; so called, because it was fancifully supposed to be situated between the lambdoidal and coronal sutures, as an arrow is placed in a strung bow. The two frontal bones are separated by the frontal suture (plate 5, fig. 1), which runs directly upwards from the root of the nose. The remaining sutures of the head are out of the way of our obstetrical observation, and a description of them would therefore be useless.

The two fontanelles are placed, one at each extremity of the sagittal suture; and they are named, according to their situation, *anterior* (plate 6, figs. 1 and 2), and *posterior* (fig. 2, and plate 7). The anterior fontanelle or *mould* of the head, is by far the larger, quadrangular or diamond-shaped: it is sufficiently extensive to take in the whole extremity of the finger, and can scarcely be covered by it. The posterior is small and triangular. The peculiar form of the anterior fontanelle is caused by the junction of the corners of four bones rounded off, the two parietal and the two frontal; the posterior is formed as a triangle by the union of three bones, the superior posterior angles of the two parietal bones, and the upper angle of the occipital bone.

Necessity for Learning the Situation of the Fontanelles and Sutures.—An accurate knowledge of the form and situation of these fontanelles is of absolute necessity for the successful practice of the obstetric art; for by them we detect the position of the fœtal head in the early stage of labour. The vertex is generally the presenting part, or that which offers itself most readily to the finger on examination.* This may be regarded, then, as the most natural presentation: the head, when placed with the vertex downwards, will pass through an aperture of much less dimensions than it would do, were any other part descending first. In plate 7 a view of the vertex is given, and two somewhat oval lines are traced surrounding it. One of these ovals is an inch, in its long diameter, greater than the other. The smaller shows the quantity of space requisite for the transit of the uncompressed head, when the vertex offers itself, four inches and a quarter by three inches and a half in diameter; the larger indicates that necessary for the same head, when the brow or anterior fontanelle presents, being five inches and a quarter by three and a half; and by contrasting the two together, the student will be able to form a correct idea of the advantages appertaining to the presentation of the vertex.

If, then, in an obstetrical examination we distinguish the posterior fontanelle readily, we know that the vertex is presenting; we may consequently presume that the fœtus is placed in the most favourable position, and we may augur, *cæteris paribus*, an easy termination of the labour. If, on the contrary, we at once distinctly feel the large, open, diamond-shaped space, we are satisfied that the brow or forehead is downward. We know that this is an unfortunate situation of the head, because so much more room will be occupied in its transit; and we are, therefore, prepared to expect that the case will be lingering: we may even feel justified in attempting to place the head in a better direction.

Nor is it of less moment that the sutures should be attended to. The cranium generally enters the pelvis with the face looking to one sacro-iliac symphysis. Should we then detect the sagittal suture running diagonally across the pelvis, we infer that the long diameter of the head is in the direction of one of the long diameters of the pelvis, and so far all is well; but if it crosses the brim in a direct line antero-posteriorly, the head is placed with its long diameter in the short diameter of the pelvic entrance; and we know that it cannot pass into the cavity while so situated, provided the skull and pelvis are both of normal form and size. Having obtained this information, we regulate by it both our prognosis and our practice.

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* The term *vertex* is applied to that part of the head from whence the hair diverges as from a centre. It is generally described as being directly over, but in fact, it is placed rather before the posterior fontanelle. It is not *perfectly* correct to say that the vertex is the presenting part, because most frequently the finger comes into contact with the parietal bone near the vertex; but for all practical purposes it is enough to describe the vertex as the point of presentation.

Advantages of the peculiar structure of the Fœtal Head.—Many advantages attend on this peculiar conformation of the fœtal skull. On the one hand, the bones being separated by intervening lines and spaces, permit a more uniform growth and development to the tender brain than could take place had the cranium been originally composed of one solid bony case; and on the other hand (which indeed most interests us as obstetricians), a certain degree of compression is allowed under labour; the edge of each bone has an opportunity given to it to ride a little over its neighbour; the capacity of the child's head is thus diminished, and it is capable of being propelled through a smaller space than if it had been fashioned of one continuous piece. This power of diminution is greatest in the lateral diameter; and a full-grown fœtal head may be lessened from side to side, without endangering the child's life, one-seventh of its own extent, or from three inches and a half to three inches. This overlapping of the bones in labour is of common, nay, almost universal occurrence: and the compressibility of the head should teach us to hesitate, and consider well the bearings of the case, before we take in hand an obstetric instrument, especially such a one as cannot be used without the sacrifice of the child's life; for it is constantly observed in practice, that a fortunate and natural termination has occurred in cases where, a few hours before, it was believed impossible that the child could be born without instrumental interference.

Some practitioners suppose, that another good effect is produced by the compressibility of the fœtal cranium. It is thought that, in the passage of the head through the pelvis, the child is thrown into a state of sleep or torpor, during which its limbs are for the time paralysed, and it is consequently prevented injuring the maternal structures by any violent movement or struggle.* I am inclined myself to subscribe to this opinion.

Expulsion of the Head vertically.—The student being now acquainted with the size and figure of the female pelvis, and the dimensions of the child's head, is prepared to understand the mechanism of its passage in cases of ordinary labour. It enters the brim with the vertex as the most dependent part,† with the face to one ilium and the occiput to the other, or more commonly with the face looking towards one sacro-iliac symphysis, and the occiput behind the groin on the opposite side of the body. Descending in this direction it takes full possession of the cavity, and the forehead and occiput impinge respectively on the inner surfaces of the tuberosities of each ischium. Since, however, in this position, its long diameter is opposed to the short diameter of the outlet—since the tuberosities of the ischia are unyielding, —and since the long diameter of the head exceeds the short diameter of the outlet by half an inch,—it is evident that a change in its relative situation must be made before it can be expelled. This alteration is effected by a slight rotation of the cranium; the face is thrown into the hollow of the sacrum, the occiput peeps up under the arch of the pubes, and the head eventually escapes with the face sweeping the sacrum, coccyx, and perineum. This turn is produced by mechanical causes, and depends on the resistance which the peculiar construction of the pelvic bones opposes to the propelling efforts exerted by the uterus:—the inner surfaces of the ischia, somewhat approaching each other as they descend, together with the spinous processes of the same bones, afford an inclined plane along which the head is directed; the hollow of the sacrum offers an unoccupied cavity, into which the face is received, and the arch of the pubes a wide-spreading sinuosity, through which the occiput insinuates itself. The fœtus, indeed, does not assist in the least degree, by any voluntary action of its own, to perfect this change; it is entirely to be explained on mechanical principles: and the opinion of the ancient physicians, that the child by its innate powers, assists in liberating itself from its imprisonment, is perfectly fallacious.

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* Hamilton MS. Lectures, 1821.

† See Note, p. 18.

OF DEFORMED PELVES.

Fortunate would it be for child-bearing women if they each possessed a pelvis of the figure and dimensions already given as the standard. Such, however, is by no means the case; and this organ is subject to great varieties, as well in form as size. It would, indeed, be difficult to select from all the preserved specimens in existence, any two which exactly resemble each other—agreeing minutely in shape, dimensions, and weight. Many are found to be much above the ordinary volume, and numbers, on the other hand, greatly below it.

The want of due capacity sometimes originates in natural formation; thus a woman of short stature, although of tolerable symmetry, might be expected to possess a diminutive pelvis; but this is far from being an universal, or even a general remark. Again, the re-union of the bones after fractures, will commonly occasion both distortion and contraction of space; but when there exists a deficiency of room to any great extent, the irregularity is mostly dependent on disease of the bones themselves.

If we look at the head of the child, and the cavity through which it has to traverse, in a mechanical point of view (which we must do before we can arrive at a correct knowledge of the process of parturition, even in the simplest and most easy state), we shall immediately perceive that *size*, as regards the head and the pelvis, is entirely a relative term; and that a pelvis preternaturally small, or a head unusually large, will each in practice occasion difficulty in the same degree as they deviate from the standard dimensions; so that it matters little whether the disproportion be the consequence of diseased action or any other cause; provided it exists to a certain extent, it must necessarily be productive of a protracted struggle.

There are two diseases particularly, through which the pelvis suffers considerable deterioration in size,—*rachitis* or *rickets*, a disorder of childhood,—and *mollities ossium* or *malacosteon*, one of adult age. In both these affections there is a want of due solidity in the osseous system throughout the whole body. The animal matter entering into the composition of the skeleton being in great excess, and the earthy matter in proportionate deficiency, the bones yield like softened wax; the regularity and beauty of the pelvic form, as well as of other bony cavities, is destroyed, and the miserable specimens of distortion portrayed in plates 8, 9, 10 and 11, are the result.

Deformity may be partial or general,—partial when either of the parts—the brim, cavity, or outlet, is simply the subject of derangement,—general, when all these are more or less involved. If the vicious formation be confined to the brim, the diminution in size is almost always produced by the promontory of the sacrum jutting too far forwards, and by this means contracting the conjugate diameter; if to the cavity, by the sacrum being too straight, so that the bone does not possess its due curvature; if to the outlet, by the tuberosities of the ischia approaching too near each other,* or by the spinous processes of the same bones being too long, and directed too much inwards; or again, by the joints of the coccyx having become ankylosed, and having thus lost their mobility. Of these irregularities the most frequent is that met with at the brim; the most rare an undue straightness of the sacrum.

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* It must be evident that if the tuberosities of the ischia approximate too closely to each other, in the same proportion the perfection of the arch of the pubes must be destroyed. The ischial and pubic bones, instead of sweeping round in the shape of a wide and well-defined arch, are fashioned into the form of a fork, resembling the same part in the pelvis of the male. The consequence of this formation is, that in labour the back part of the child's head, instead of fitting close against the triangular ligament of the pubes, is pressed lower down; the face of the child is therefore thrown farther back, the coccyx is placed more upon the stretch, and the perineum considerably more distended. This of necessity occasions increased suffering and delay. If the cavity of the sacrum is too straight, the due rotation of the head cannot occur; and this forms an impediment to easy delivery.

It is easy to account for the frequency of contraction at the brim, because the base of the sacrum supports the whole weight of the trunk, head, and upper extremities; and as the sacral promontory partakes of the curve forward proper to the lumbar vertebræ, it is reasonable to suppose that, if any degree of softness exists in the bones, they will bow at this point first, being unable to resist the superincumbent pressure. Giving way in this manner, the lowest lumbar vertebra, and the upper part of the sacrum, will be thrown inwards, so as to dip over the entrance to the pelvic cavity.

If we rest a perfectly straight wire perpendicularly on a table, and place a weight upon its top greater than it can sustain, it will bend, but at what part we cannot tell. If, however, we make the least elbow in it before we try the experiment, we shall find that it will yield there rather than in any other part. This is exactly analogous to the condition of the sacral promontory and last bone of the loins.

In plate 8 two specimens are given of this kind of deformity at the brim. The original from which fig. 1 was engraved, is preserved in the London Hospital Museum: it measures five inches in the lateral diameter; two inches and three-quarters in the sacro-pubic; and the same from each side of the sacrum to the ramus of the pubis. This is just below the minimum space through which a full-grown fœtal head could pass entire; but the ischial tuberosities are four inches and three-eighths apart, the distance between them being full a quarter of an inch more than in a healthy pelvis, so that the outlet is wider than natural; and as the sacral curve is well proportioned, if the head once gained possession of the cavity, it would speedily, and with little further exertion, be expelled.

The second figure represents the pelvis of a woman whom I delivered in a state of great exhaustion, under a primary labour, by craniotomy; it is considerably contracted in all its dimensions, more especially at the brim. The diameter, from the centre of the prominence of the sacrum to the symphysis pubis, is only two inches and a quarter; the iliac diameter four inches and three-quarters; on the right side of the promontory of the sacrum to the pubic ramus, the space is two inches and a half; on the left side two inches and a quarter. The cavity is much below the natural size, the depth posteriorly being not more than four inches; the outlet also is considerably diminished, as well by the width between the ischia measuring only three inches and a quarter, as by the elongation of the spinous processes of those bones.

In many cases of partial deformity at the brim, the lateral diameter is increased in length somewhat in the same proportion as the conjugate is diminished; but however much the width from ilium to ilium may exceed the ordinary dimensions, the increased space thus obtained will in no degree make amends for the diminution from the sacrum to the pubes; because it is necessary that there should not exist less than a certain quantity of available room in *every* direction to permit the child's transit.

When the deformity is complete, by involving the cavity and outlet as well as the brim, it may be of two kinds—angular, as shown in plate 9,—or elliptical, as in plate 11. In the angular distortion the promontory of the sacrum is thrown forwards; the tuberosities of the ischia closely approach each other; and the symphysis pubis projects outwards. The pelvis bears the appearance as though it were formed of ductile matter, and the pubic bones at each side of their junction had been squeezed forcibly together, so as to compress the brim into a triangular shape. In the elliptical, the sacral prominence projects forwards; the tuberosities of the ischia are separated to a much wider extent than is usual; and the bones at the symphysis pubis are flattened, being forced back towards the sacrum; thus a greater lateral diameter is given both to the brim and the outlet.

It is generally believed that the elliptical species of distortion (plate 11) is invariably the consequence of rickets; while the angular (plate 9) is as invariably produced by mollities ossium: and Dr. Hull, in his Second Letter to Simmonds, has, by a very ingenious chain of reasoning, endeavoured to substantiate this hypothesis. I am far from subscribing to the universal truth of this doctrine; but I am inclined to think that both these diseases may occasion each variety.

To render the subject more easily understood, I shall divide pelves into four gradations, and I shall classify them according to their form at the brim, since that is the part most usually, as well as most severely, distorted. The first embraces the standard pelvis—five inches and a quarter in the lateral diameter, by four in the conjugate, and all above that measurement, through which a mature fœtus will escape with facility.

The second class includes those lower than the standard, but sufficiently large to permit the child's passing alive, being either expelled by the unaided efforts of nature, or extracted by instruments which are perfectly compatible as well with its preservation as with the safety and integrity of the woman's structures. A live birth at full time may be accomplished through a pelvis which possesses a clear available space of three inches in the conjugate, by four in the lateral diameter. Some practitioners have thought that a pelvis measuring only two inches and three-quarters in the conjugate diameter would allow of the head passing whole, provided there were sufficient room laterally. My own conviction, derived from clinical observation, is, that the dimensions I have just mentioned are the smallest which will grant a passage to a full-grown, well-formed, living fœtus.*

In the third class is comprehended every pelvis of such a size as would admit of a well-educated practitioner extracting a fœtus through it, after the bulk has been diminished by cutting instruments to the smallest possible compass. Although most obstetricians agree that three inches by four is about the least space through which a full-sized fœtal head will pass entire, there is an extraordinary difference of opinion in regard to this other question; some thinking that little more than an inch in the conjugate diameter will suffice;† others, that very considerably more is required.‡ This discrepancy may perhaps, in some measure, be accounted for by the superior tact which long and constant practice in obstetrical operations gives; for it is reasonable to suppose that a person unaccustomed to these duties will not succeed so well as one to whom they occur frequently. It is left to me, therefore, to form a scale of my own as the lowest limit through which a child can be drawn after mutilation; and I am quite convinced that, unless there be at the brim one inch and three-eighths in the conjugate, by three and a half in the iliac, or one inch and a half in the conjugate, by three in the iliac, it would be useless to attempt delivery *per vias naturales;* but as it will very rarely be found that the lateral diameter at the brim does not exceed three inches, so the conjugate diameter is that to which our attention should be more particularly directed.

In making our computation, however, we must bear in mind that if the pelvis be distorted according to the elliptical form it will generally be found that a less amount of room in the conjugate diameter at the brim is sufficient for extraction, than if it be of the angular variety; and this depends on the alterations which the cavity and outlet have undergone in each;—the tuberosities of the ischia being thrown farther from each other than natural in the former, whilst they approximate more or less closely in the angular. Thus, in the one case, the difficulty will be almost entirely confined to the brim; but in the other, the shape both of the cavity and outlet will offer a great impediment to the extraction of the child.

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* Davis (Principles and Practice of Obstetric Medicine, p. 25) says, If the pelvis amount to no more than three inches in the conjugate diameter, a well-grown child could not be expected to pass entire. Osborn (Essays on Mid. p. 194) thinks it will not pass if there be not more than two inches and three-quarters. While Barlow (Essays on Surgery and Mid. p. 305) considers that space sufficient.

† Denman's Introduction to Midwifery, c. xiii., sec. 4.

‡ Davis (p. 1167) and Osborn (Essays on the Practice of Midwifery, p. 230) think one inch and a half requisite. Hamilton (Letter to Osborn, p. 131) and Hull (First Letter to Simmonds, p. 118) do not consider it possible to extract through so small a space as that. Burns (Prin. of Mid. p. 460) believes one inch and three-quarters requisite, and Dewees (Mid. p. 593, note) considers two inches in the antero-posterior, and at least three and a half in the transverse, necessary

In addition to this, it may be remarked, that in the elliptical form, both is the pelvis shallower, and consequently the head more within reach, and also, that the outlet being more capacious, there is more room for the manipulations necessary to effect delivery.

In the last class of gradation are to be included all pelves below the minimum space just mentioned: through which it is impossible for the most skilful and experienced operator to extract a fœtus, even after the brain has been evacuated, and the body diminished to the utmost extent that art can accomplish. In cases of such extreme deformity, no means remain of rescuing the woman from death through exhaustion but to open the abdomen, cut into the uterine cavity, and extract the fœtus by the artificial aperture; an operation horrible to contemplate, and which in the British Islands has, with five exceptions, proved universally fatal to the mother.

The subjects for the plates have been selected with the view of illustrating the different positions laid down. The measurements of the two distorted pelvès in plate 8 have been already given: through the first, some obstetricians think it possible that a full-grown and commonly ossified fœtal head might pass entire with great exertion, though I should much doubt it: through the second, no mature fœtus of ordinary weight could be born alive.

In plate 9 are given two specimens of the angular distortion. The brim of fig. 1, in its long diameter, measures four inches and a half; the greatest available space between the pubes and sacral promontory is one inch and five-eighths; on the left side of the promontory there are two and three-eighths; and on the right side two inches and a half. The tuberosities of the ischia at their nearest points approach each other to within an inch and three-fourths; and the distance between the tip of the coccyx and the under edge of the symphysis pubis is four inches and a half. It would be perfectly possible to deliver the patient who possessed this pelvis, by the operation of craniotomy.

Fig. 2 is a cast of the pelvis (now so well known from the copies having been multiplied to a great extent) of Isabel Redman, on whom Dr. Hull performed the Cæsarean operation on Sept. 22, 1791.[*] A single glance will show its extreme deformity; to demonstrate which, it is only necessary to mention, that a ball of one inch in diameter will not pass through the brim at any part. I believe this is the smallest pelvis, as far as regards the brim, on record.

Fig. 1, plate 10, represents the bony pelvis of a woman,[†] the subject of one of the late Mr Barlow's cases of the same operation; by whom the preparation was presented to me. From the junction of the fourth and fifth lumbar vertebræ (which is the most projecting point, in consequence of the sacral promontory being thrust down considerably lower than the level of the pubes) to the outer surface of the symphysis pubis, is three inches; the clear space within being, from the same point to the ramus of the pubis on the right side, seven-eighths of an inch, on the left side an inch and three-eighths; from the same point to the acetabulum on the right side, three-quarters of an inch, on the left side an inch and a quarter. The greatest quantity of available room in the antero-posterior diameter, is from the left side of the sacral promontory to the ilium, and measures an inch and a half. The greatest lateral space following the curve is five inches and three-eighths; at the outlet, the ascending rami of the ischia are in close contact, and the centre of the tuberosities are an inch and a half distant; the sacrum just below its centre is curved at an acute angle upwards, so as to bring the apex of the coccyx to within an inch and a half of the promontory of that bone, and two and a half to the point where the two rami of the ischia touch each other. Although the operations undertaken in both these instances proved fatal, nobody can deny the necessity and propriety of their performance.

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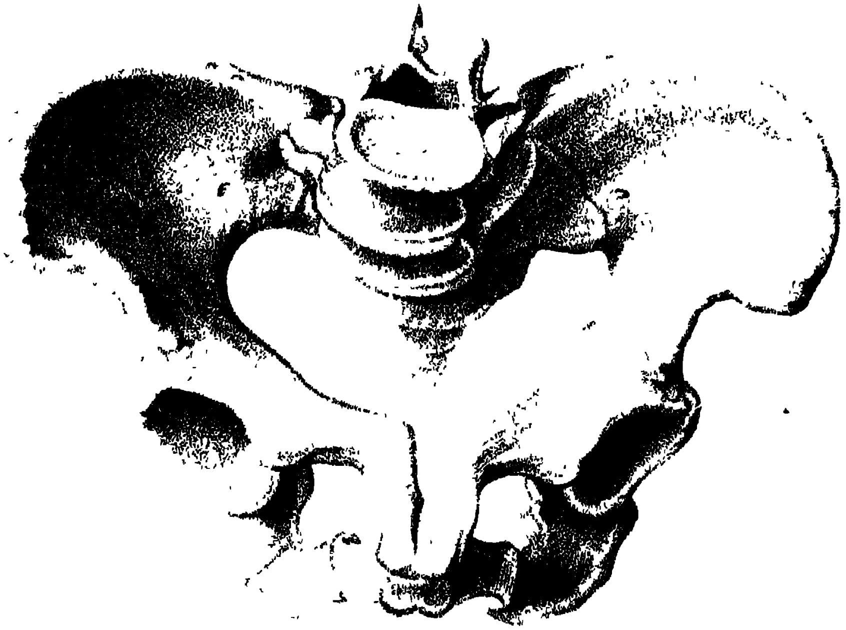
[*] Letter to Simmonds, in Defence of the Cæsarean Section, p. 172.

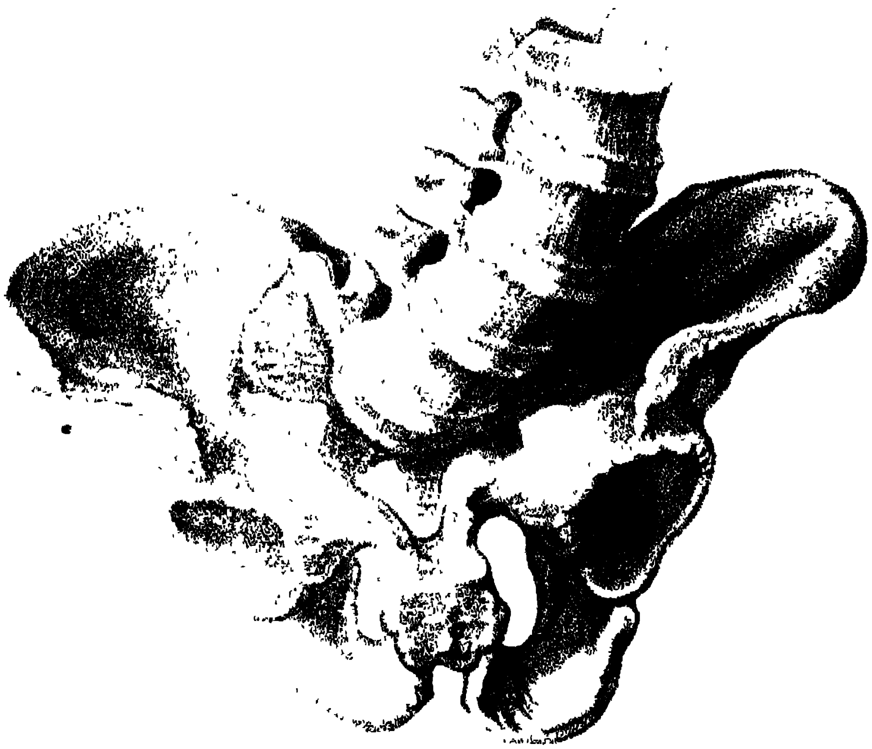
[†] Jane Foster of Blackrod. See Barlow's Essays on Surgery and Midwifery, pp. 331 and 355.

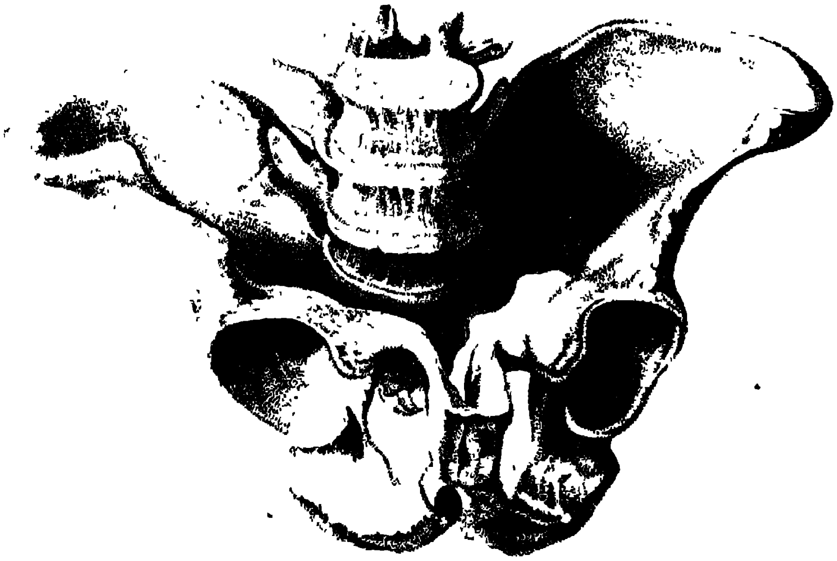
Fig. 2, in the same plate, is taken from a lithographic drawing in the work of M. Moreau, published in the year 1837. It is introduced here for its rarity. The original is in the anatomical collection in the Maison d'Accouchemens at Paris; but I have not been able to meet with a similar specimen in London. Two or three may be found in which a tendency to this figure exists, though in a very slight degree; and one is preserved in the University College Hospital that somewhat resembles it. That, however, is a male pelvis, and the deformity was occasioned by fracture; this is a female, and the cause was disease.

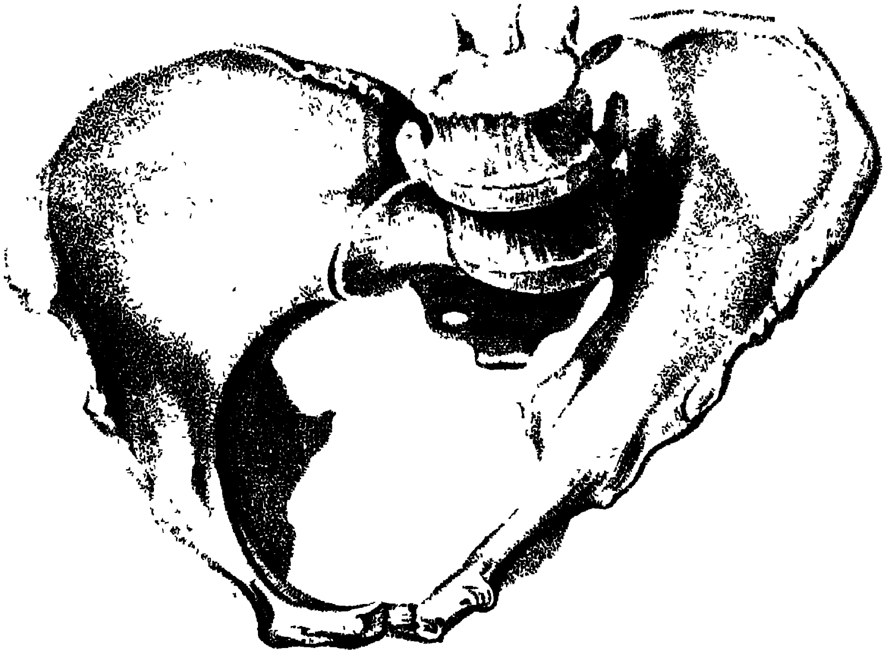
Plate 11 demonstrates the elliptical variety of distortion from casts. In fig. 2 the distance between the symphysis pubis and sacrum is one inch and a half; on the right side of the sacral promontory in the antero-posterior diameter there are two inches; on the left side, only three-fourths of an inch. The lateral diameter of the brim following the curve in a central line equidistant from the sacrum and pubes, measures six inches and a quarter; at the outlet, the extreme width between the ischia is five inches and a half; from the apex of the coccyx to the under part of the symphysis pubis, four and a half. Through a pelvis of this form and size the fœtus might be extracted by the instruments adapted to craniotomy.

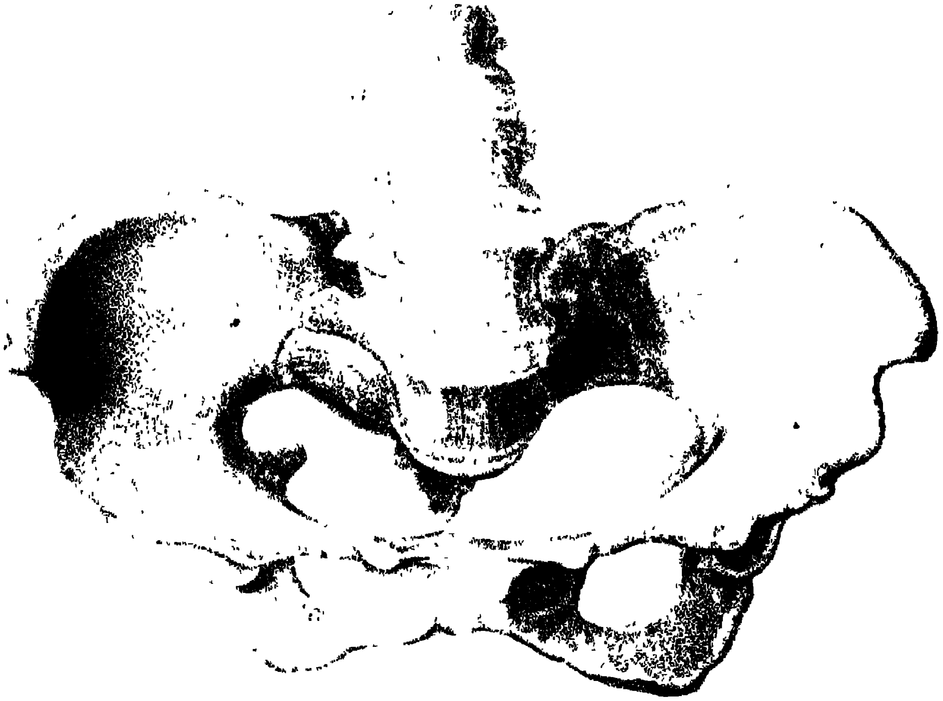
The original of fig. 1 is much smaller, and I fear, if such a conformation existed, the child could only be extricated by the abdominal incision. In this instance from the pubes to the sacrum

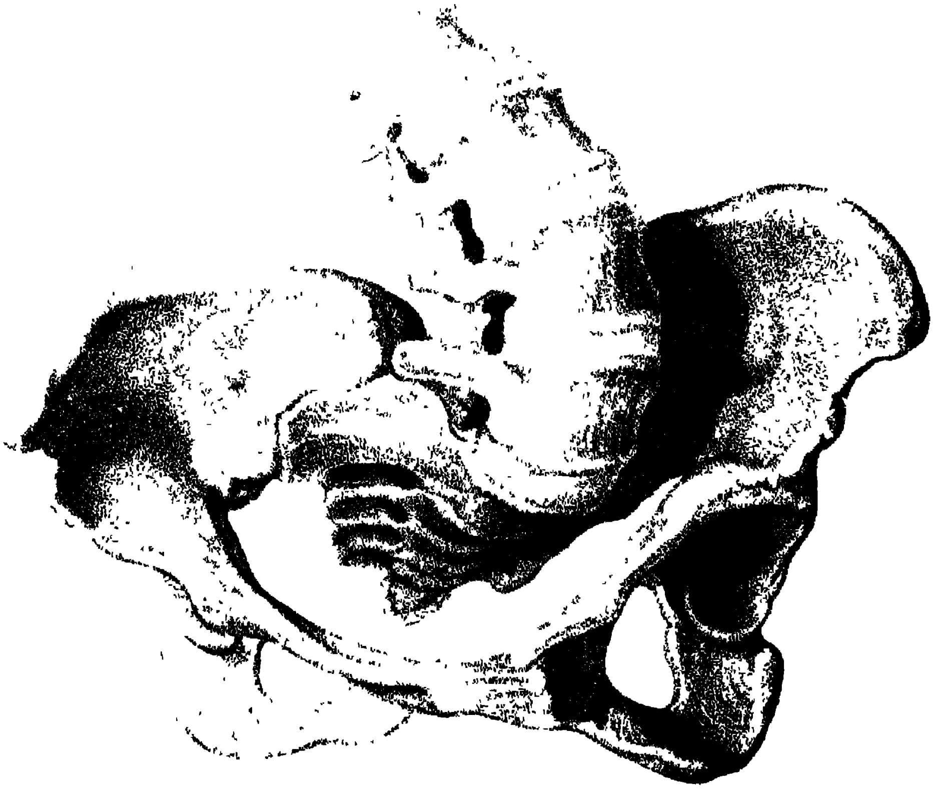












measures no more than three-fourths of an inch; on the right side of the sacral promontory there is one inch and a quarter; on the left side, an inch and five-eighths. At the outlet, the tuberosities of the ischia are four inches and an eighth asunder; but the space between the apex of the coccyx and the under part of the symphysis pubis is only two inches.*

These examples will be sufficient to give an idea of the great alteration which the pelvis undergoes when its bony structure is attacked by disease; it is needless, therefore, to adduce a larger number.

OF PELVIMETERS.

Much ingenuity has been displayed by our Gallic neighbours in the invention of instruments for the purpose of measuring the conjugate diameter of the pelvis at the brim; and Coutouli's pelvimeter and Baudelocque's callipers, are those best known. The former consists of a flat base and a moveable slide, into which it is fitted; at the end of both the base and the slide a piece of metal projects at right angles. This instrument, indeed, resembles that by which shoemakers are accustomed to measure the length of the foot: it is to be introduced within the vagina; the extremity of the base is to be carried up to the promontory of the sacrum, and the projection at the end of the slide brought behind the symphysis pubis. By a scale which hangs out beyond the external parts, the space between the apex of the pubic arch and sacrum may be known. Making, then, an allowance for the difference between the slanting and direct diameter, it was supposed we might become acquainted with the actual available space there existing. This contrivance is easily adapted to a skeleton pelvis, and so would a common rule be; but its application when the soft parts are preserved, is difficult; and, from its straight figure, impossible, if any part of the child's head be engaged in the pelvic brim. As, therefore, that pelvis must be exceedingly distorted which would not allow the head to descend somewhat into the cavity, Coutouli's pelvimeter is found practically valueless.

The *compas d'épaisseurs* or *callipers* of Baudelocque are intended to be applied externally to the woman's person. They consist of a base or handle, formed of two parallel pieces, and joined at their lower extremity by a hinge; from the upper end of the handles two curved arms rise, having at their points two small buttons. One of these is to be placed upon the outer surface of the symphysis pubis,—the mons veneris; and the other on the lower end of the loins, opposite to the sacral promontory. A scale of inches is adapted to the handle, and so calculated, that it is supposed to indicate the exact space between the promontory of the sacrum and pubes, within the pelvis. This may, perhaps, be perfectly true in regard to a standard pelvis, or one deviating but little from the ordinary size; but no person can regard the various specimens of deformity shown in the plates, without being perfectly convinced that, if taken as our guide in all cases of distortion, it would afford the most conflicting and erroneous results.

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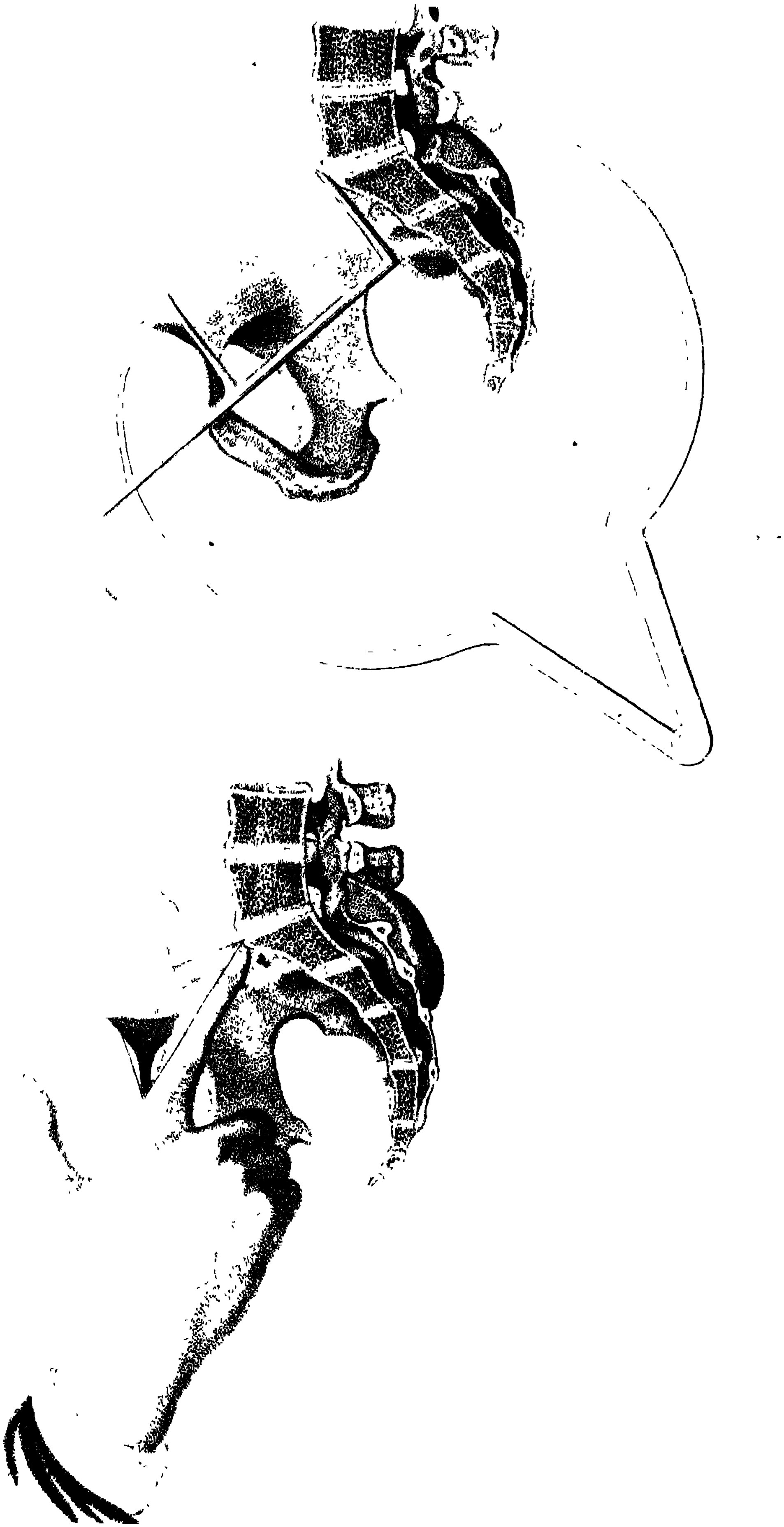
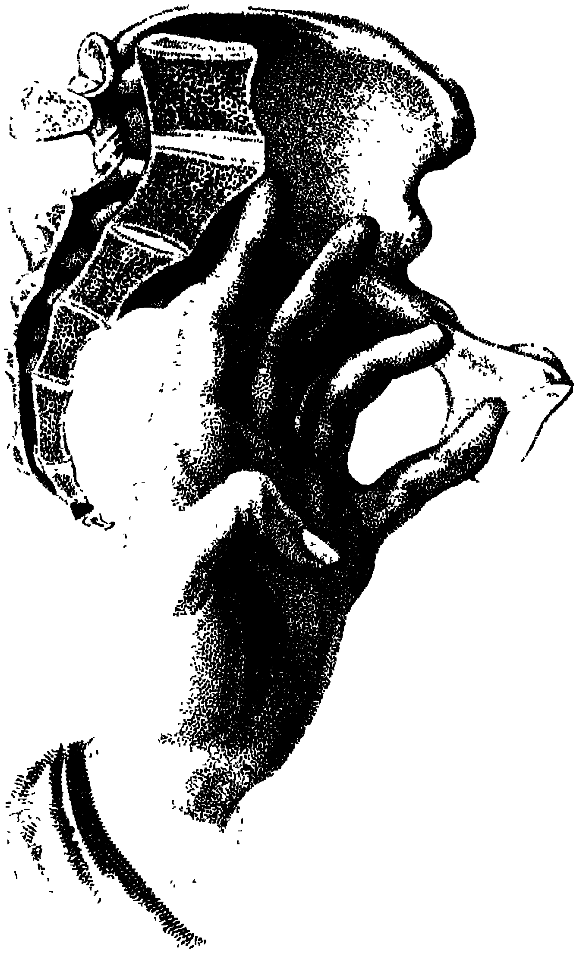
* This figure was taken from a cast of the pelvis of Martha Rhodes, a patient on whom Mr. Thomson, Surgeon to the London Hospital, assisted by John Hunter, performed the Cæsarean section on October 20th, 1769. This is the first operation of the kind performed on the living woman in England, of which we have any record. Both Dr. Cooper, under whose immediate care she was, and Mr. Thomson, have given us histories of the case (see Med. Obser. and Enquiries, vol. iv. pp. 261 and 272).

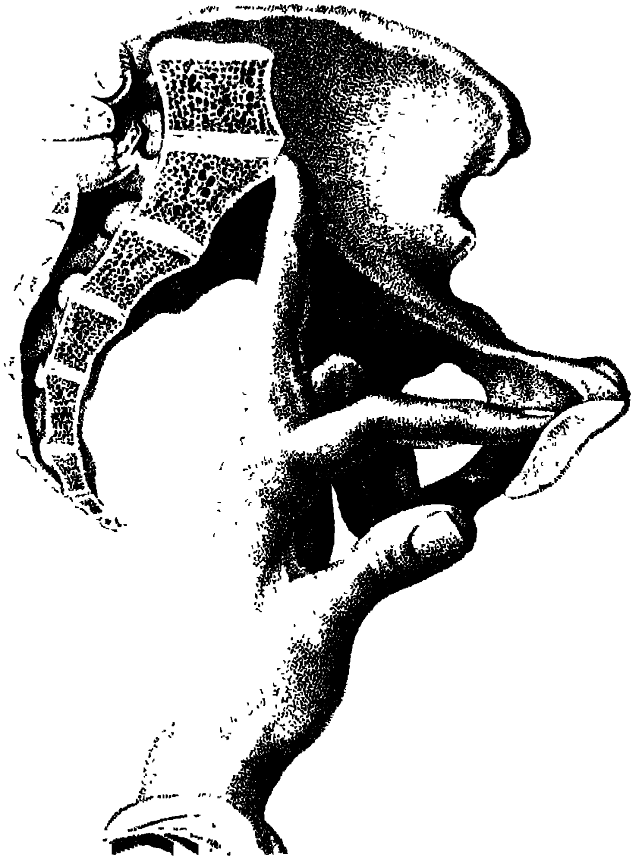
In plate 12, fig. 1, the application of both these mechanical inventions is sufficiently well displayed to require no further illustration.

Such contrivances for the purpose of measuring the pelvic brim have by no means met with the sanction of British practitioners in general; but they are in the habit of depending for this information on examinations conducted by the fingers or the hand. Three methods are practised: one is, by the introduction of the first finger of the right hand within the vagina, so that the point should be carried up to, and touch the sacral promontory, while the root of the finger is applied exactly under the symphysis pubis, at the upper part of the arch (plate 12, fig. 2). It must be evident that this mode of inquiry will be of no avail unless the pelvis be greatly distorted,—considerably under three inches, indeed, in the conjugate diameter. For the ordinary length of the index finger along its inner edge is less than three inches; and as the oblique line from the promontory to the apex of the pubic arch exceeds the direct line across, so if there be more than the space just mentioned, the finger would not be able to reach the projection, and we should consequently be in utter ignorance of what amount of room existed. If the pelvis be very small, the sacral promontory can be felt with ease; but even in that case the dimension of the direct conjugate diameter is not afforded, but the length of the oblique line is given; and it is not always possible to calculate the difference between these two lines accurately.

Another mode which has been recommended is the introduction of the whole left hand within the pelvis, with the outside or point of the little finger touching the inner surface of the symphysis pubis, and the first finger placed against the promontory of the sacrum. As every man is aware what his hand measures across, it is supposed he will be able to ascertain the transverse width of the pelvis. Thus, presuming the hand to be two inches and three-quarters wide, which is the common average about the centre of the fingers, if, when placed edge-ways, it just fits the brim, the







examiner will know that the space is within three inches. Again, if he can only introduce three fingers instead of four, he will know that the pelvis does not measure two inches, and probably not so much; and if he can only pass up two fingers, closed together, he will be assured that there is not more than an inch and three-eighths. But, on the contrary, if, on introducing the whole hand, he be compelled to spread his fingers widely before he can touch the sacral promontory, he will then be certain that the space is more than three inches, probably four, or near it. (Plate 13, fig. 1.)

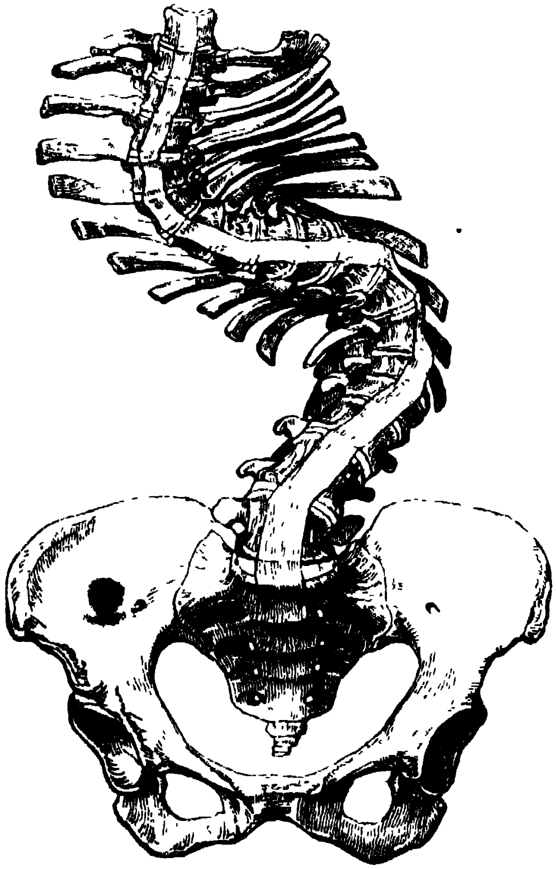
But it is not always easy to follow this mode of inquiry, because the child's head is generally protruded somewhat into the pelvis, even when the brim is contracted; and we could not carry the hand up in this manner, and make the accurate examination which we require to do, unless the brim as well as the cavity were perfectly free and unoccupied. It might, perhaps, be employed with advantage, provided the deformity were excessive.

The third method I consider the best, and is the one I myself adopt. Two fingers of the left hand are to be carried within the vagina; the extremity of the first finger is to be placed exactly behind the symphysis pubis, and the tip of the second against the sacral promontory. (Plate 13, fig. 2.) By stretching the fingers in this way, we shall have little difficulty in reaching the promontory of the sacrum, even when the pelvis is of ordinary dimensions; and by withdrawing them in the same position, we may measure off the distance between their extremities on the first finger of the right hand, or on a scale of inches, as with the limbs of a pair of compasses; and consequently we arrive at an accurate knowledge of the exact dimensions of the pelvic brim. The laxity of the vagina, and other soft structures, which almost invariably attends the process of labour, will permit [illegible] fingers to be withdrawn while extended; and if the examiner uses sufficient care, they may be kept perfectly steady until the space which they embrace be ascertained.

This mode of proceeding possesses a great advantage over the other two, inasmuch as we are able equally well to make our examination, whether the head be occupying a part of the pelvic cavity, or whether it be still detained quite above the brim; for even if it be engaged in the vagina, one finger may be passed anterior to, and the other behind it, with comparative ease.

But although in most instances the brim demands the principal part of our attention, the shape and capacity of the cavity and outlet must not be neglected. To inform ourselves on these points, the fingers being gently carried along the hollow of the sacrum, notice must be taken of the degree of curvature which that bone possesses, and of the mobility of the coccyx. The width between the tuberosities of the ischia, as well as the inclination of the spinous processes, must also be made the subject of observation.

We may *suspect* that the pelvis is deformed if the spine be very much curved, and particularly if with that distortion the thigh bones be bent considerably; for in such case we may fairly infer that the curvature of the spinal column has not arisen from any local disease of the vertebræ, but from some general constitutional affection, such as rickets, or mollities ossium; and when the system is influenced to any great extent by either of these diseases, we cannot expect that the pelvis will escape derangement.



It must be borne in mind, nevertheless, that any opinion we may entertain as to the pelvic capacity from the general form, will at the best, amount only to suspicion; for however crooked the spine may be, it by no means *necessarily* follows that the pelvis is distorted.

By the annexed cut it will be seen, that although the spinal column has suffered lateral curvature to an extreme degree, yet the pelvis possesses the ordinary diameter at the brim, and the outlet is so slightly diminished in its proportions, that the fœtus would be expelled through it with great facility. Instances of this kind are to be met with in every anatomical museum. When the spine indeed becomes distorted after puberty, the pelvis seldom suffers; but when the distortion occurs during infancy or childhood, it is almost always more or less altered in shape.*

It is by internal examination alone,—and that during labour,—that we can obtain any *positive* information as to the state of the pelvis. We may, indeed, in cases of great deformity, even at other times, detect the projection of the sacral promontory, or the approximation of the ischia, by the introduction of one or two fingers into the vagina; but an accurate knowledge of all the pelvic dimensions can only be gained when the soft structures are relaxed by the process of parturition.

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* "Inter fœminas gibbas multo sunt plures, quarum pelvis sine vitio est, quam quibus ob deformitatem partus, inde molestus fiat." Boer, Naturalis Med. Obstetriciæ, lib. vii. p. 341.

Of preternaturally large Pelves.—From what has been already advanced, it will be readily conceded, that few greater evils could befall a child-bearing woman than to be the subject of a contracted pelvis; and it might be supposed, therefore, that the possession of a very large one was to be esteemed a great blessing. But this is far from being the case; and an organ much exceeding the standard proportions must be regarded as very liable to entail danger both on the mother and her offspring.

One of the most common accidents to which a woman with a preternaturally large pelvis is exposed, is the descent of the gravid womb. When a certain period of pregnancy has passed, the uterus, which before that time had remained within the pelvic cavity, rises by degrees through the brim, and occupies a portion of the abdomen. By this change in its situation, the viscera, blood-vessels, and nerves at the lower part of the trunk, are relieved from the pressure they had been previously exposed to. But whenever the pelvis is sufficiently capacious to give it lodgement for a longer duration than should be, it sinks by its own weight lower than it ought, and much inconvenience is felt from its subsidence. In some cases, moreover, the gravid womb has been known to prolapse beyond the external parts, hanging as a large tumour between the thighs, inverting the vagina, and dragging down with it both the bladder and the rectum. Abortion is likely to be excited by such an occurrence; and thus a preternaturally large pelvis may lead both to the loss of the ovum, and to chronic and confirmed prolapsus uteri.

Another distressing and dangerous accident to which a woman possessing a very large pelvis is generally supposed to be peculiarly obnoxious, consists in the retroversion of the pregnant womb;—when the fundus, instead of mounting towards the abdomen, is turned back upon the promontory, or falls down into the hollow of the sacrum. To a certain extent, this position is true; for retroversion of the uterus is more likely to happen in case of excessive capacity than where the organ is near the standard size. But by far the greater number of instances of this description which have come under my observation have been combined with a slight diminution of space in the conjugate diameter at the brim; and I am, therefore, warranted in concluding that such a formation more frequently predisposes to this cause of danger than an undue capacity.

A third inconvenience, and one of no slight importance, is the rapidity with which a fœtus will sometimes be expelled through a pelvis of extraordinary dimensions. Provided the os uteri be widely open, the other soft parts lax and distensible, and the uterine energies are exerted vigorously, the child may be expelled so quickly that no assistance can be rendered; under circumstances, too, in which both its own life and its mother's must be brought into imminent peril.

OF THE FEMALE GENERATIVE ORGANS.

The female organs of generation are classed in two divisions,—*external* and *internal.* The external consist of the *mons veneris, labia externa, perineum, clitoris* with its *prepuce, nymphæ, vestibule, meatus urinarius, hymen* in virgins, and *carunculæ myrtiformes* in matrons.

The internal are, the *vagina, uterus,* and *uterine appendages;* which latter consist of *two broad ligaments, two round ligaments, two ovaries,* and *two fallopian tubes.*

EXTERNAL ORGANS.

At the lowest part of the abdomen, lying immediately over the pubes, is situated a soft cushion-like eminence, about three inches in breadth, and two in depth, called the MONS VENERIS (plate 14, *a*). It is formed of a large quantity of loose cellular tissue, the interstices of which are filled up with much adipose matter; it is covered by the common cuticle of the body; and at puberty, is studded with a number of short capilli, among the roots of which are embedded numerous sebaceous follicles.

Arising from the mons veneris, and running down perpendicularly, to unite at a junction below, there are two pouting lips, the LABIA EXTERNA, OR LABIA PUDENDI (*b*). In length they are about three inches, and in structure they exactly resemble the mons veneris. The commissure at which they join is called the FOURCHETTE (*c*). It is somewhat similar in appearance to the continuation of the skin at the roots of the fingers, and is the anterior boundary of the perineum.

THE PERINEUM (*d*) extends from the lower union of the labia externa back towards the anus (*e*). Its structure is principally made up of highly distensible cellular membrane; it does not possess in its substance a great deal of fat, and the skin is but scantily furnished with hair. Its length is about an inch or an inch and a quarter in the quiescent state of the parts; but when the child's head is pressing externally in labour, it is capable of elongation to three, four, or even five inches; and in the same degree that it is extended in surface it becomes thinned in substance. It is to this part of the body that the obstetrician, during natural labour, is required to direct a principal share of his attention, for the purpose of preventing laceration and injury. These parts, closing and surrounding the genital fissure, altogether constitute the PUDENDUM.

On separating the labia externa, a line of demarcation is distinctly evident in each, where the skin of the body terminates, and the mucous membrane investing the organs within commences. This continuation of the mucous into the cuticular structure is exactly similar to the arrangement observable in the openings of other cavities—as the anus, nose, and male urethra. A hollow is also observed, which in the virgin is bounded posteriorly by the hymen. This has obtained the name of CONCHA OF FOSSA NAVICULARIS, and it contains within its precincts the clitoris with its prepuce, the nymphæ, the vestibule, and the meatus urinarius. The whole of the external parts together, as well those that are lined by mucous membrane, as those covered by the common cuticle, are called the VULVA.

THE CLITORIS, (*f*), or rather that portion of it which is visible, is placed rather above and anterior to the lower edge of the symphysis pubis. In formation it bears a great analogy to the male penis: it resembles it, indeed, in every respect except two—its small size, and its not being permeated by the urethra. Like the male penis it is composed of *two crura*, which arise from the rami of the ischia and pubes, one on each side, run up to the junction of the bones at the symphysis, and there form the *corpora cavernosa.* These are also furnished with two muscles resembling the erectores penis in the male. At the extremity of the corpora cavernosa is placed the *glans;* this is the only part of the organ that we can observe by the eye, the others being embedded between the mucous membrane and the bone. Above the glans projects a duplicature or fold of membrane, covering it like a hood—apparently for the purpose of protection—the PREPUTIUM CLITORIDIS (*g*). The clitoris is the most sensitive part of all the external organs. It is capable of distension, as the male penis is. It is liberally supplied with blood from the pudic artery; and with nerves from branches of the pudic fasciculi.

Taking their origin from the clitoris, and sometimes arising from its prepuce, there are two other distinct folds of mucous membrane, which run downwards parallel to the labia externa—the NYMPHÆ, OF LABIA INTERNA (*h*). They consist of membranous rugæ—two layers connected by cellular substance—possess an erectile tissue, and at their termination they are ultimately lost in the lining membrane of the parts. They are mechanically opened out during the passage of the fœtal head in labour, and, by affording an increase of surface, assist in preventing laceration of the membrane.

Between the two nymphæ, running downwards and inwards round the lower edge of the symphysis pubis, and leading directly to the meatus urinarius, a smooth groove, of about an inch in length, is situated, termed the VESTIBULE (*i*). The surgeon will find it highly necessary to pay attention to this furrowed depression, because in the introduction of the catheter it guides his finger to the entrance of the urethra.

THE MEATUS URINARIUS (*k*), the mouth of the urethra, which is the canal leading to the bladder, is situated at the further extremity of the vestibule. It is a small closed aperture, capable of admitting with ease the barrel of a goose quill: and is so distensible that a much larger cylinder can be introduced. It is essential that we become acquainted, not only with the situation of this aperture, but with the character which it affords to the touch; because when the bladder requires to be artificially evacuated, it is most desirable that the instrument used for that purpose should be passed in by the aid of the finger alone, without exposing the woman's person to the eye. This operation is frequently required, as well during labour as under different states of organic disease and functional derangement. In the more natural state of the parts we shall find the meatus to consist of an eminent, soft, circular rim, with a central depression, that would appear scarcely large enough to permit the insertion of a small wire; and if its position is borne in mind, a little practice will enable the student to introduce the catheter with facility. But when the structures are pressed upon by a long-continued lodgement of the child's head in the pelvis under labour, such a confusion is occasioned by their extension or tumefaction, that the peculiar character of this part is lost, and much difficulty may be experienced, both in detecting it and guiding the instrument into it. In such case, it is infinitely better to expose the patient to the inconvenience of an ocular inspection than to allow the bladder to become overcharged, to the imminent risk of its bursting, or to the no less probable chance of a fistulous orifice being formed between its neck and the vagina.

THE HYMEN* (*l*) is the posterior boundary of the fossa navicularis, and, placed at the entrance of the vagina, it divides the external

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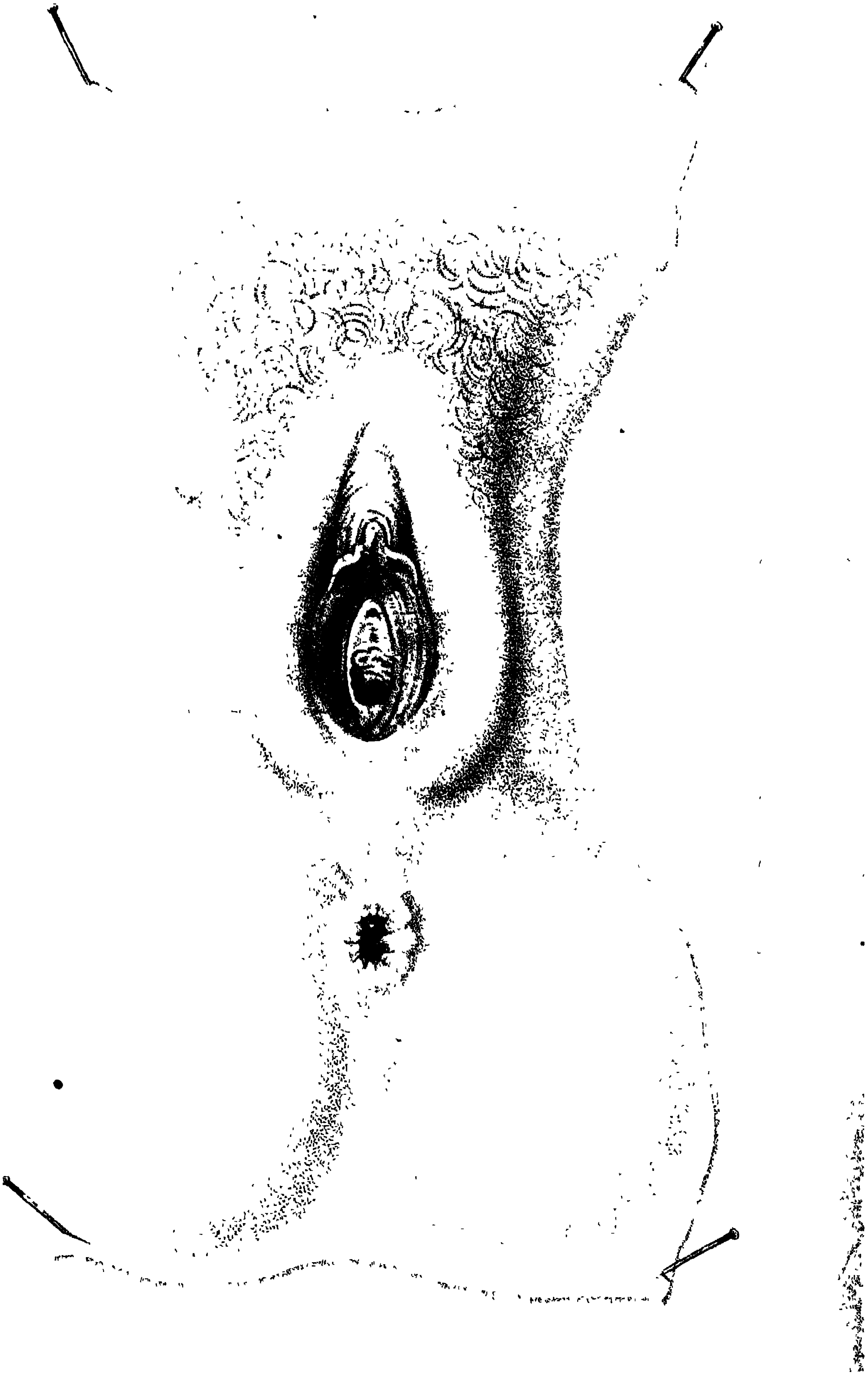
* The name hymen was adopted after the Greek word ὑμὴν, a membrane. From its bearing most frequently a crescent shape, this membrane has been fancifully pictured as the origin of the characteristic symbol of the virgin goddess Diana, as though she carried on her brow the stamp of her purity. It is a pretty poetical idea, but we can trace her typical figure to a much more probable source. Diana, in the beautiful poetry of the heathen mythology, was generally identified with Luna; and it is by far more likely that she derived this distinctive emblem from the crescent moon.



from the internal organs. It consists of a very delicate membrane, generally of a semilunar shape, stretched directly across the parts, and having an aperture anteriorly,—the horns of the crescent being directed upwards and forwards. Sometimes, however, the opening is central, and serrated on its inner edge; at others, it possesses a number of small punctures: it is then called *cribriform*: and at others it is impervious, in which state, on the accession of puberty, it gives rise to many very distressing and dangerous symptoms, consequent on the retention behind it of the menstrual and other secretions.

It is usually ruptured on the first sexual access, but by no means universally so. Upon its destruction the membrane disappears, and has been supposed to dwindle into a number of little eminences, which have been called, from their fancied resemblance to myrtle-berries, the CARUNCULÆ MYRTIFORMES. Lately, however, it has been doubted whether these carunculæ were really the débris of the broken hymen; for it has been demonstrated by some physiologists, that both the hymen and carunculæ may exist together in the same subject, and that therefore they are perfectly independent formations.

Although the presence of the hymen was formerly considered as a test of virginity, from the supposition that it was invariably broken on the consummation of matrimonial intercourse, this idea has long been repudiated; for it is now well known, not only that it may be destroyed and lost from numerous causes originating in disease or accident, but also that in some instances it does not give way upon the first nor many subsequent connexions; and even that pregnancy has taken place while this membrane was entire. So that its presence can be no positive proof of personal chastity, nor its absence of immorality.

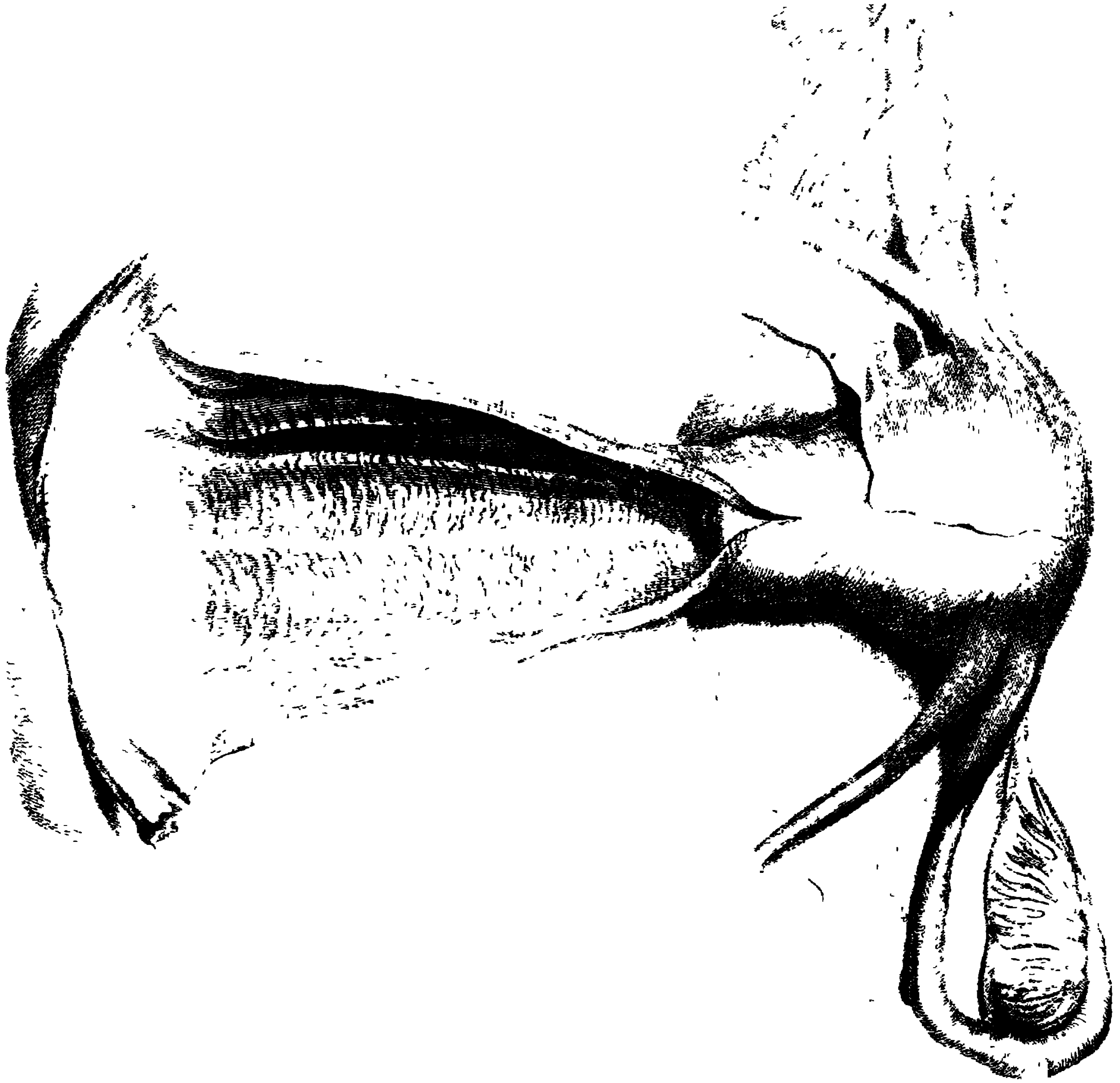
All the organs immediately within the genital fissure are profusely supplied with blood from branches of the internal iliac arteries, and with nervous influence from the pudic filaments. The absorbent vessels, also, are both large and numerous, and communicate with the sacral and inguinal glands.

INTERNAL ORGANS.

THE VAGINA (plate 15 *k*, and 18 *r*) is a musculo-membranous canal, running up the centre of the pelvis, leading from the external parts to the os uteri, in its progress describing a curve even greater than that of the sacrum and coccyx, having the neck of the bladder, the urethra, and the symphysis pubis anteriorly, and the rectum behind it. In length it is about four or five inches; in circumference about three. It varies much, however, in different subjects, and is capable of extension to an extraordinary degree. In married women, and those who have had a family, it is considerably more capacious than in virgins; it is also wider in the middle than at either extremity, and longer on its posterior surface than anteriorly. It is composed of three coats —an external, cellular; a middle, muscular; and an internal, mucous. The external coat is merely a collection of condensed cellular structure, by which it is attached to the parts surrounding it. The middle coat is muscular, and the fibres follow different directions; some are longitudinal, some transverse, and some oblique. The muscular fibres are much more numerous at the commencement of the vagina than at any other part. Here they seem arranged in concentric circles, taking their origin from the sphincter ani, to which formation anatomists have given the name of *sphincter vaginæ*. The internal coat is mucous, and is a continuation of the membrane which lines the external parts; it is collected into transverse, or rather oblique rugæ; and from this circumstance it has also obtained the name of the *rugous coat* of the vagina.

These folds are much more apparent in the virgin, than in women who have borne children; and, like the muscular fibres, they are found in the greatest number at the lower end near the commencement. In the interstices of the rugæ are placed a number of follicles, which, independently of the mucus poured out by the vessels proper to the membrane itself, secrete a fluid of a peculiar character. The membrane is puckered thus, principally for the purpose of allowing the distension of the vagina during the passage of the child's head. The sebaceous follicles are more numerous towards the lower end of the canal, and at the entrance of the vagina, are sometimes large enough to be visible by the naked eye. The vaginal canal becomes much contracted in advanced life, and, even in the virgin at that time, presents a smooth surface within, instead of the plicated membrane.

This organ is very plentifully supplied with blood-vessels, with nervous filaments, and absorbents. It obtains its blood through branches of the two uterine arteries, which are given off from the internal iliacs or hypogastrics. The common iliacs divide into two channels, the external and internal; the internal descend into the pelvis, over the sacro-iliac synchondroses. From them arise the uterine arteries, which run up one on each side of the vagina, and in their course give off many transverse branches, which supply the vagina itself. Its nerves are principally derived from the sacral plexus; its veins accompany the arteries, and the absorbents pass in two directions, one division to the glands in the sacrum, and the other to those in the groin. The vagina is connected below with the external parts by a continuation of



structure; anteriorly, with the symphysis pubis, the urethra, and the neck of the bladder, by cellular membrane; above, with the cervix uteri, and behind, it is attached to the rectum. The commissure connecting these two organs is called the *recto-vaginal septum*. It runs down, in connection with the rectum, through a great part of its extent; but the vagina, at its lower end, turns at an angle forwards; while the rectum, just before terminating in the anus, is directed somewhat backwards, so that a space of about an inch in extent is left between them—the perineum.

The secretion of the vaginal membrane, in the ordinary healthy state of the parts, is almost exactly balanced by the natural absorption, so that there is little or no exudation externally: but under peculiar states of excitement, under some diseases also, as well as under labour, the secretion much exceeds the absorption, and a discharge appears outwardly.

UTERUS.—At the upper part of the vagina, hanging in the centre of the pelvis, behind the bladder and before the rectum, with its superior edge somewhat peeping up above the brim of the pelvis, supported in this situation by two ligaments which run from its sides to the ilia, and by the vagina, which is below, is situated the UTERUS,* MATRIX, or WOMB, the organ destined to receive, to afford lodgment and nourishment to, and eventually to expel, the ovum.

In shape the uterus is somewhat triangular, or rather like a flattened pear; and it is observed to be rounder on its posterior face th[illegible]teriorly, from which circumstance, in the unimpregnated sta[illegible]ays distinguish the right from the left side. In length [illegible] inches; in width, at the widest part, about two; an[illegible]arly an inch. It varies, however, in different subjec[illegible] in some degree larger in women who have borne many children, and smaller in virgins. Anatomists, for the facility of teaching, describe it as though it consisted of four parts; to the upper third they give the name of *fundus*, to the middle the name of *body*, and to the lower third that of *neck*; while its opening into the vagina they designate the *os uteri*, or *mouth of the womb*. The two first of these divisions are perfectly arbitrary; there is no septum in the uterus, no line of demarcation either externally or within, by which we can point out their limits; not so, however, with regard to the cervix; because it becomes narrower at its upper part, where it joins the body; nor to the os uteri, which is the means of its communication with the vagina—a natural aperture. Plate 16, fig. 1, shows the longitudinal section of the uterus; *a*, the fundus uteri; *b*, its body; *c*, the cervix; *d*, the os uteri; *e*, a small portion of the upper part of the vagina. The central line shows the direction of the cavity.

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* Derived from the Greek ὑστερα.

The uterus is covered externally by the peritoneum; it has a cavity which is lined by mucous membrane, and a peculiar parenchymatous structure between the two. The peritoneum, after having lined the abdominal muscles, rises over the bladder, giving a covering to a very considerable portion of that viscus; it then passes from the neck of the bladder directly backwards to the cervix uteri; it mounts over the uterus, and descends on the back part somewhat lower than in front, dipping even a little beneath the os uteri, affording an external coat to a small portion of the vagina, and separating the uterus entirely from the rectum; it is then continued from the upper part of the vagina to the lower gut, and ascends to embrace the bowels. From the sides of the uterus processes are sent off, which constitute the broad ligaments.

The parenchymatous structure of this organ is of a very dense character, in appearance much resembling a half-tanned hide. On making a section of it, we observe a great number of very minute tortuous vessels running throughout its whole substance; in the unimpregnated state they are scarcely capacious enough to receive the finest injection; but they take upon themselves a process of growth as soon as conception has occurred; and towards the end of pregnancy many of them are sufficiently large in calibre to admit the barrel of a goose-quill.

The uterus is generally considered by anatomists of the present day as a muscular organ; and, although this has been doubted by some respectable physiologists,* it is now usually classed among the hollow muscles of the body.

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* Much difference of opinion has prevailed among physiologists, as well as practical physicians, as to whether the uterus is a muscular organ or not. Bichât, Blumenbach, and my late father contended for its non-muscularity; while Vesalius, Malpighi, Ruysch, and Hunter, with most modern anatomists, maintain that its tissue is truly muscular. Sir Charles Bell declares "the substance of the gravid uterus powerfully and distinctly muscular;' and he has minutely described, in the fourth volume of the Medico-Chirurgical Transactions, the direction of the different fasciculi of its fibres.

The powerful contractions which it exerts, and which belong to muscular structure alone, as well as the anatomical appearance of the fibres themselves in the gravid state, and soon after labour, would incline us to the latter view of the question; while the fact of the organ remaining for so long a period, sometimes indeed throughout the whole of life, quiescent and inert, together with the paleness of the fibres when unimpregnated, would lead to a belief that the former idea was correct.

It is quite possible that both may be true, that the fibres of the virgin uterus, which are so difficult of satisfactory investigation, and which present so little that is characteristic, may be developed into muscle on the occurrence of pregnancy, and again revert to their original, apparently non-muscular condition, when the changes subsequent on labour are perfected.

We see constantly how wonderfully Nature adapts herself to exigencies, and know that tissue of one kind is often converted into that of another, according as circum-

This viscus contains a cavity which is lined by mucous membrane, being a continuation of that lining the vagina. In the body of the uterus the membrane is smooth and of a pale red colour. When examined by a magnifying power, minute points may be seen dotting it throughout the whole extent. These are the orifices of simple tubular glands, somewhat similar to those of the intestines;[*] some being straight, or branched, others more or less coiled. They are almost a quarter of an inch in length,[†] and are arranged vertically by the side of one another like basaltic columns; they are only seen in the body of the organ, none being discoverable in the neck, where the glandulæ Nabothi appear instead. They can be distinctly observed even in the virgin uterus, are more apparent under the menstruous action,[‡] and become most conspicuous after impregnation. These glands form the deciduous membrane.[§] It is probable also that the same organs furnish the menses.[‖]

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stances require the substitution. To cite only one instance, we frequently meet with cases in which the uterus having prolapsed and remained external to the body for a considerable time, the mucous membrane of the vagina forming its outer covering, has been gradually changed into a structure closely resembling the common cuticle of the body, and has again resumed both the appearance and function of mucous membrane, on the restoration of the uterus, and its preservation within the pelvis, Such a change is not more wonderful than the development of the indistinct uterine fibres into true muscular tissue, when the requirements of gestation call for the necessity.

It may be urged against this idea that, under some diseases, the uterus takes upon itself powerful contractile efforts, or becomes the subject of violent spasms, such as we can only attribute to muscular tissue; and that, therefore, either the stimulus of pregnancy is not necessary to occasion this transformation, or the fibres of the organ, as they exist in the unimpregnated condition, possess a power resembling that of muscle itself. Under the presence of polypus, for instance, before the tumour has escaped into the vagina, the uterus often contracts with great force upon the mass within its cavity—so strongly indeed, that it has been known to break the stem and expel the offending body altogether; one instance of which has come under my own observation. In dysmenorrhœa also we are accustomed, and I think correctly, to regard the pain suffered as produced by spasmodic action in the uterine fibres themselves.

[*] Quain and Sharpey's Anatomy, p. 1263.

[†] Muller's Physiol. p. 1574.

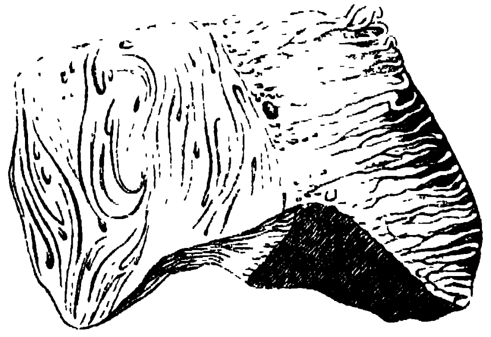
[‡] Coste Hist. gen. et part. du Dev. des Corps Organ., p. 208.

[§] Quain and Sharpey's Anatomy, vol. 2, p. 1266. Muller, Phys. [illegible]1574.

[‖] Coste (Loc. citat.) Since it is now pretty generally believed, that at each catamenial period, a Graafian vesicle bursts and allows an ovule, though unfecundated, to escape from its ovarian bed; that, indeed, menstruation is nothing more or less than balked or "disappointed pregnancy," is it not likely that the same matter which under menstruation shows itself as a viscid fluid, would, had impregnation taken place, have become the deciduous membrane?—especially as the same structures furnish both products; and more particularly, as in some cases the menstrual action is accompanied by the formation and discharge of a perfect membrane, which has, to the naked eye, much of the appearance of a true decidua. The secretion is furnished as a consequence of the escape of an ovule from the ovarium: if fecundation occur, it is required for the formation of the deciduous membrane and retained; but if the ovule perishes, the elaboration of a deciduous membrane is not necessary, and the fluid is allowed to exude externally, as a superfluous and effete secretion.

The two accompanying cuts well display this glandular structure.

The first is taken from Coste's splendid Atlas, *Du Développement des Corps Organisés*, published in 1847, and shows the appearance of the tubes in a woman soon after she had been the subject of the menstrual action. It is a section of the whole thickness of the uterus, the fibrous structure of the substance being strongly contrasted with the tubes, which are observed to run parallel with each other. The cavities of the divided tubes are shown at the lower portion of the drawing.



The second is from Weber,* and is a section of the tubular structure of the upper half of the uterus, at the commencement of pregnancy (*a a*, the cavity of the organ into which the tubes *b b b*, open). The same arrangement is carried on to the cervix. The fibrous portion of the uterus is here dissected entirely away, nothing being left but the glandular apparatus. Both these drawings are magnified above twice their natural size, and I have introduced them both, because, since they are given by two physiological writers, the very similarity that exists between them proves the accuracy of their representation.† The internal membrane at the neck of the womb is puckered into longitudinal or arborescent striæ, more evident in the virgin than in women who have had children (plate 16, fig. 8, *b*). This formation is denominated the *arbor vitæ*. In the infant, the whole inner membrane is corrugated.

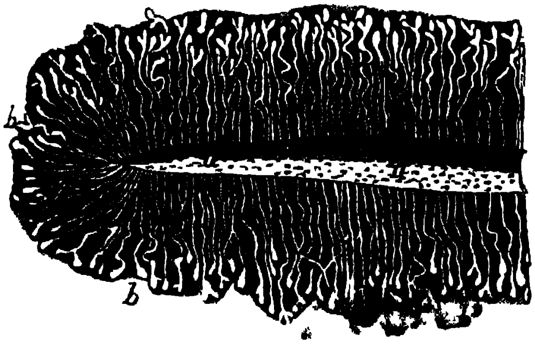


Figure 2 shows the infantile uterus laid open; *a*, the inner

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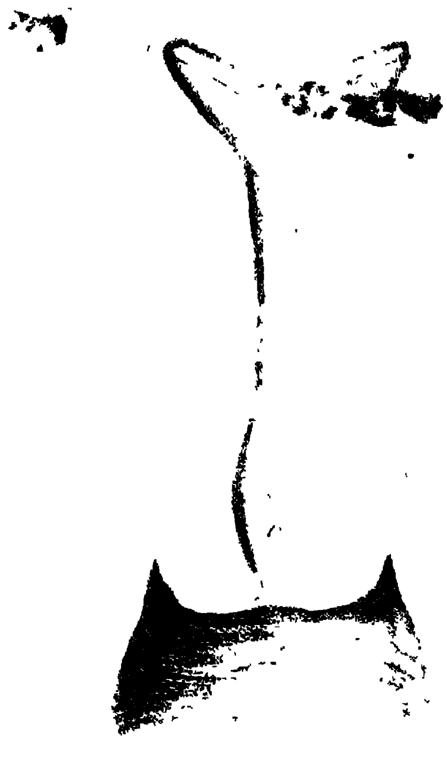
* E. H. Weber; Zusätze sur Lehre vom Baue, und den Verrichtungen der Geschlechtsorgane. Leipsig, 1846. 4to.

† For a more particular account of these glands, the student is referred to Sharpey's Description in Muller's Physiol. by Baly, p. 1575. Also, to a pamphlet published in Paris in 1848, by Dr. C. Robin, entitled "Mémoire pour servir a l'Histoire de la Membrane Muqueuse Uterine," &c., in which the structure of the uterus is more minutely described than in any work that has fallen under my observation.



membrane of the uterus; *b*, the os uteri; *c*, the upper part of the vagina.

The cavity of the uterus is somewhat similar in shape to its external form: it is rather triangular, and large enough to contain a split almond. Into it three apertures open; two at the angles of the fundus, the uterine extremities of the Fallopian tubes,—and one below, communicating with the vagina—the mouth of the womb. The Fallopian tubes do not enter the uterus in a straight line, opposite to each other, but obliquely; from which arrangement the bristles passed along the tubes cross each other at a considerable angle when received into the cavity. Fig. 3 displays the uterine cavity laid open;—*a*, the os uteri; *b*, the cervix; the longitudinal lines show the appearance called arbor vitæ; *c*, the uterine extremities of the Fallopian tubes, with a bristle inserted into each.

The opening into the vagina is called the *os uteri*, *os tincæ*,[*] *os internum*, or the *mouth of the womb*, and by it a free communication is permitted between the cavities of the vagina and the uterus. But it must not be supposed that the uterus is connected with the vagina by a direct continuation of their separate structures; on the contrary, the vaginal coats run up a few lines above the orifice, to terminate at the cervix uteri; and the mucous membrane is reflected over its mouth, to line it within; so that the os uteri pouts and projects somewhat into the vagina, at an angle, looking considerably backwards, towards the upper part of the coccyx (plate 18, *q*).[†] In the adult subject, the os uteri is of an oval shape, the slit being lateral, and dividing it into an anterior and posterior lip. In the virgin it will with difficulty admit the extremity of a flattened catheter; but it is generally more dilated in women who have had children, in whom also it is often fissured. At the upper extremity of the cervix, just where the cavity of the body commences, there is a narrowed portion distinctly to be recognised in figures 1 and 3, plate 16, to which the term *os internum uteri* is sometimes given. This constricted part will often prevent the ready admission of the uterine sound into the cavity of the womb, when that instrument had passed through the mouth itself with facility. Thickly studding the os uteri, as also the cervix, we observe a number of follicles, called *glandulæ Nabothi* (plate 29, figs. 1, 2, 3). These are scarcely perceptible in the healthy uterus of the virgin; but they enlarge much under pregnancy, during which state they become very evident to the eye, With this increase of size, a new office is afforded them; they pour out a thick, tough, pellucid, gelatinous mucus in considerable quantities, which blocks up the entrance to the cavity of the uterus, and breaks off the communication between it and the vagina; and as long as this mucus remains *in situ*, no fluid can be injected into the uterus. Plate 24 is designed to show the appearance of this mucus at the cervix uteri.

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[*] *Os tincæ*, from its fancied resemblance to the mouth of a tench fish.

[†] The length of that portion of the cervix uteri, which pouts or projects into the vagina, varies a good deal, even as a natural and healthy formation. In some females it is less than a quarter of an inch; in others, it considerably exceeds half an inch. My observation has also led me to believe that it is generally longer in those who have borne many children than in virgins.

The uterus is very liberally supplied with blood-vessels, with nerves and absorbents. The arteries are from two sources; one set, the *spermatic*, descend from the aorta, below the renal arteries, sometimes by one trunk from the anterior part of that vessel, and sometimes by two, one on each side: at others they have been known to take their origin from the renal arteries. They descend with the same tortuous inflections as the spermatic vessels in the male, supply the ovaries, and afterwards run along the broad ligaments, to expend themselves in the uterus;—the other, the *uterine*, are given off from the internal iliacs, and anastomose very freely with the uterine branches of the spermatic. By these two sets of vessels, a very copious supply of blood is allowed—one originating high up in the loins, and the other low down in the pelvis. The veins follow the course of their respective arteries. The spermatic have the same termination as the spermatic veins in the male—the right in the inferior cava, the left in the renal vein. The uterine veins empty themselves into the internal iliacs. The nerves also are from two sources: one supply is derived from the sacral plexus of the cerebro-spinal system, the other from the great sympathetic; and it is through the filaments of the latter nerve that most of the vital organs of the body, especially the stomach, sympathise so completely with the uterus, as well under disease as under pregnancy. The absorbents also run in two directions, one into the lumbar and sacral glands, and the other through the round ligament into the glands of the groin. The connections of this organ are with the sides of the pelvis, by the broad ligaments which principally support it; with the vagina inferiorly; with the neck of the bladder anteriorly, by cellular substance; and with the groin, by means of the round ligament. It cannot be said to be connected with the rectum, because the peritoneum dips down sufficiently low to separate it perfectly from that gut, giving an outward tunic to a small portion of the upper part of the vagina. In this respect the posterior differs materially from the anterior surface of the uterus, because there is a direct connexion in front between the cervix uteri and the neck of the bladder by cellular tissue.

Broad Ligaments.—From the side of the uterus two duplicatures of the peritoneum extend to the ilia. They are called the

BROAD LIGAMENTS, and sometimes, from their shape—since they are fancifully supposed to spread out like the wings of a bat—the ALÆ VESPERTILIONIS. They contain the Fallopian tubes, which run on their upper margin; the ovaries, which are enclosed in a posterior fold; the round ligaments on their anterior face; and blood-vessels, nerves, and absorbents, destined to supply the uterus itself. These ligaments, together with the uterus and vagina, divide the pelvis into two chambers, one anterior, the other posterior; they are well seen in plate 15, *e e*; the right is shown in plate 18, *m*. There is also another double extension of the peritoneum on each side, not usually described by anatomists, arising from the angle of the fundus uteri, and running backwards to the sacrum and lumbar vetebræ.* These, in conjunction with the lateral ligaments, are for the purpose of supporting the uterus in its situation, while hanging in the centre of the pelvis, and of guiding it in its ascent to the abdomen during the middle months of pregnancy (plate 19, *h h*).

OVARIES.—Dangling somewhat loosely between the duplicatures of the broad ligament posteriorly, at the distance of about an inch and a half from the edge of the uterus, on each side are placed the OVARIA (plate 15, *i i*, 18, *l l*, and 19, *g g*). They are oval, glandular bodies, about the size of a large almond; and previously to the time of Steno, who first asserted that they were analogous to true ovaria, they were called the FEMALE TESTES.† Enclosed within this fold, they obtain their external covering from the peritoneum; their surface is consequently smooth and shining. Besides the peritoneal coat,—indusium—they possess beneath it another,—their proper tunic—tunica albuginea;—and an impervious cord extends from each to the side of the uterus,—the ligament of the ovary. They are supplied with blood by the spermatic arteries, as already stated; and derive their nerves from the spermatic plexus, which is chiefly formed by the renal. When a section is made, their structure is found to consist of dense cellular tissue,—stroma,—in which is embedded a number of small cavities or vesicles, varying in size from the minutest pin's head to that of a large shot, the lesser being within, the larger more towards the surface. The fluid which these cavities contain is pellucid and coagulable by alcohol, heat, and the strong acids — composed, therefore, principally of albumen. In number they vary from twelve to fifteen in each ovarium. They are called after De Graaf,‡ *vesiculæ Graafianæ.* We may remark them sometimes rather eminent upon the surface. In the course of my dissections, I have occasionally seen two or three projecting under the peritoneum, studding the external face of the gland like beautiful little pearls, and on pricking them the fluid has exuded. We do not see these vesicles much before puberty; they disappear, or become altered towards the close of life, when the gland is shrivelled by age; and are found in the greatest number, and most apparent, in the adult virgin. The vesiculæ Graafianæ have been long described as containing whatever the female supplies towards the formation of the embryo. The late researches, indeed, of the talented and indefatigable Baer* have detected floating loosely in the vesicle before impregnation a minute body of spheroidal shape,—the ovulum,—which is admitted by those physiologists who have most deeply studied the subject since this discovery was made, to be perfectly similar in all its essential qualities to the ovum of birds and other ovipara. It is now proved to demonstration that this small spheroidal body contains the germ from whence will spring the future man, being vivified by the mysterious agency of the male semen during the process of conception; and each Graafian vesicle may therefore be regarded as an *ovisac*.

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* The recto-uterine folds, or "*plicæ semilunares* of Douglas." Quain's Anatomy vol. 2, p. 1263.

† Nicholai Stenonis Elementorum Myologiæ Specimen, &c.; Amsterd., 8vo., p. 145. De Graaf confirmed Steno's views, De virorum et mulierum organis generationi inservientibus, Lugd. Bat. et Roterod., 1668, 8vo., p. 299.

‡ These vesicles had been described by Vesalius and Fallopius before De Graaf.

Corpus Luteum.—In the ovary of a woman recently pregnant, besides these vesicles, we observe,—as a consequence of the late conception,—the deposition of a newly secreted mass of matter, about the size of a large pea or small bean, generally containing a central cavity, which is sometimes empty, at others filled with coagula; it is somewhat fabiform, of a dull yellow tint, resembling in hue the buffy coat of the blood, and when newly exposed, slightly red. The name CORPUS LUTEUM was given to it by Malpighi,† from its colour; ‡ it had been previously called by De Graaf CORPUS GLANDULOSUM, § for it possesses much of a gland-like appearance. Hunter, || indeed, described it as "tender and friable, like glandular flesh." Rœderer ¶ compares its structure to that of the supra-renal capsules of the fœtus; and Montgomery ** speaks of it as "obviously and strikingly glandular." Haller also describes it as *glandulæ conglobatæ simile, rubrum, vasculosum.*††

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* De Ovi Mammalium et Hominis genesi.

† See Blumenbach in Commentat. Soc. Reg. Scient. Gotting. vol. ix. p. 109.

‡ This body is not always of the colour which its name would imply; for Montgomery has depicted one of a bright scarlet hue taken from a woman who died of Hysteritis, and he considers this change in the colour as the effects of inflammation. Paterson, however (Ed. Med. Journ., Jan. 1840, p. 57), says he has seen the same colour existing where there were no signs of inflammatory action. In the bitch and ewe the corpus luteum is pinkish;—in the sow of a light red; in the cat and rabbit of a dingy, and in the cow of a bright orange yellow.

§ De Organis Mulierum, &c., p. 177. || Anat. of Gravid Uterus, p. 14.

¶ Icones Uteri Humani Gravidi, p. 45. ** Signs and Symp. of Preg. p. 225.

†† Opera Minora, Lausannæ, 1767, vol. ii. p. 457.

Corresponding with its situation externally there is observable a distinct cicatrix on the surface of the ovary, indicating the spot through which the ovulum contained in the Graafian vesicle has escaped into the Fallopian tube. The aperture has, in some rare instances, been found still pervious when the conception was very recent.

The corpus luteum will present different appearances according to the length of time that has elapsed since impregnation. In the more early state that portion of peritoneum which covers it projects with a nipple-like eminence considerably beyond the surrounding surface; and minute vessels are seen ramifying over it (plate 17, fig. 2, and 17 A, fig. 1). On dividing it, the central cavity is sometimes clearly distinguishable, of a tolerably regular circular, or oval figure, around which is deposited the peculiar substance that forms its principal, essential constituent—yellowish, and possessing numerous thread-like vessels ramifying through it (plate 15, fig. 3, and 17 A, fig. 3). As gestation advances, the regularity of the central cavity is destroyed (plate 17, figs. 4 and 5); it diminishes in size; the blood, if any had been contained in it, is gradually absorbed; the membrane lining it, which was originally the inner coat of the Graafian vesicle, becomes corrugated, plicated, and puckered into folds; and the cavity is by degrees entirely obliterated; the walls of the cyst, thus gradually collapsing, are brought into close contact; and a series of white lines, all that remains of the previous cavity, is perceptible, traversing the proper substance of the luteum in a radiated or stelliform arrangement (fig. 6). This star-like appearance continues so long as there is any trace of the luteum left; and it forms one of the strongest if not the most distinguishing mark of the true body. During this process, both the vascularity and external projection are day by day decreasing; the recently secreted yellow matter is being slowly removed, and the ovary restored to its former volume and appearance. The substance of the luteum having been entirely absorbed, the two membranes originally forming the coats of the Graafian vesicle come together again, and take upon themselves the appearance of a small deposit of condensed cellular tissue.

It is not easy to determine the date from conception at which the central cavity becomes closed and lost. Montgomery has found it existing in the sixth month from impregnation; and thinks it may invariably be seen up to the end of the fourth month;* and Paterson has met with it not unfrequently after mature delivery.† Equally difficult is it to assign a date to the disappearance of the luteum from the ovary altogether. It has been seen so long as five months from labour at the full term; but in most instances it has ceased to be visible before that time; so that the common idea that this is a permanent structure, and that an examination of the ovaries after death will enable us to tell the exact number of children which any woman has borne, from the number of corpora lutea existing in these glands, is quite erroneous.

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* Op. Citat. p. 227.

† Edinb. Med. Journal, Jan, 1840, p. 57. In plate xvii. A, fig. 3, the central cavity still exists, the woman having advanced to nearly seven months of gestation.

The formation of this body is explained in the following manner. It has been demonstrated that the Graafian vesicle possesses two membranes, one adhering to the substance of the ovary, the other enclosing the fluid in which the ovule of Baer floats. When a fruitful connexion has taken place, a great determination of blood is made to that ovary which supplies the germ. The gland becomes larger, rounder, and more vascular, than the other; to the touch it feels fuller and softer. But the vascularity is confined to one part—the neighbourhood of the corpus luteum; and the increased size and softness result not so much from an alteration in the structure of the whole organ, as from the quantity of lymph and fluid blood deposited between the membranes of the vesicle, which is converted into the characteristic yellow gland-like mass.[*] This effusion causes the vesicle to be thrown prominently out towards the peritoneal surface; the attenuated coats burst, or rather an opening is formed by absorption, and the fluid with the ovule previously contained within them passes into the tube.

False Corpora Lutea. Haller's aphorism, that "*conception never happens without the production of a corpus luteum,*"[†] has, I believe, never been disputed; but his other proposition, that "*the corpus luteum is never found in virgin animals, but is the effect of impregnation alone,*"[‡] has been canvassed very extensively. Some physiologists have supposed that true corpora lutea, or bodies analogous in appearance to them, can be formed in the ovaries of virgins;[§]

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[*] Professor Baer, Op. Cit. p. 20, thinks that the corpus luteum is produced by a thickening of the inner membrane of the Graafian vesicle; "me judice minime corpus novum est, sed stratum internum thecæ majus evolutum;" and the same opinion is held by Raciborski (Bulletin de l'Acad. Roy. de Médecine, Oct. 15, 1844), by Baly (Supplement to Müller's Elements of Physiology, 1818, p. 54); and many of the most recent German and French authors; while T. Wharton Jones (Med. Gaz. vol. i. 1843-44, p. 461,) and Dr. R. Lee (Med. Chirurg. Trans., vol. xxii.) believe that it is formed outside of both the membranes. My own opinion, derived from dissections, coincides with that of Drs. Montgomery and Paterson, who have described it as in the text.

[†] Op. Minora, vol. ii. p. 458.

[‡] Op. Cit. p 457.

[§] "The corpus luteum, or yellow body, is a peculiar substance found in the ovaries of animals that have lately *passed through the rutting season*, and of women that have *lately been affected with their menstrua, or have become pregnant.*" (Meig's Treatise on Obstetrics, 1852, p. 122.) I have quoted on this occasion from Dr. Meig's work, because it is the latest system of Obstetrics that has issued from the press in the English language. Sir E. Home, Blundell, Bostock, Bischoff, and Baly may also be quoted as believing that corpora lutea may be produced independently of impregnation, and that therefore they cannot be received as proofs of pregnancy.

while others have expressed themselves so vaguely on the subject, as to leave their opinions in great doubt. The possibility of such an occurrence is a question of first-rate importance in many medico-legal investigations; and consequently it is incumbent on every one who touches upon this subject to endeavour to put it in a clear light.

It is perfectly true that spots of various size, shape, colour, and consistence, are met with in the virgin ovary of all animals, differing essentially from the surrounding tissue; but it is equally true that in structure they are very unlike that new product, the result of impregnation; and with care the one may always be distinguished from the other.* The *real corpus luteum*, in the first weeks after conception, is round, or more frequently of a bean-shaped form; it often possesses a cavity, sometimes unoccupied, at others filled with the blood which was extravasated at the time when the coats of the vesicle gave way—at the moment, indeed, of impregnation. It is vascular, and its vascularity may be shown by injection. Its two coats may be distinctly traced, and the buff-coloured, lymphy deposit, in which newly-formed vessels ramify, may be observed between them (plate 17, fig. 3, and 17 A, fig. 3). One only is ever found at the same time, except the woman had conceived of twins, or had aborted very lately before the last conception.† The ovary on its external surface, above the spot where the body is situated within, is more prominent and much more vascular than at any other part (plate 47, fig. 2 and 17 A, fig. 1). If examined soon after impregnation, an aperture will be discovered communicating with the central cavity, should such a cavity exist, which shortly heals up, and a cicatrix—the result of the healing process—is very evident at the same point. In the more advanced stage the central cavity is contracted, and at length becomes destroyed, and in its place are seen the radiated or stellated lines already mentioned, which are then its best distinguishing mark (plate 47, fig. 6). The luteum itself diminishes in size in proportion to the distance of time from conception.

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* Montgomery, Paterson, Lee, Ritchie, Raciborski, Deschamps, Renaud, and Müller, may be mentioned as holding this opinion, at least as far as the human female is concerned. I look upon it as a very unfortunate circumstance, that physiologists of observation, and of such deserved repute, should differ on a subject which involves so important a question as the one under consideration. It will be seen that I am fully impressed with the belief, that the characteristic marks between the true and false corpora lutea are so distinctive, as to render it not only possible, but easy, to discriminate between them. Dr. Baly, in the last-published physiological work (Supplement to Müller's Physiology, 1848, p. 57), gives no sign by which they may be distinguished but *size*, which is a very fallacious guide. He thinks, if the body discovered be less than a common pea, no conclusion can be drawn in favour of the idea, that it resulted from pregnancy;—but if larger, it may be taken as presumptive evidence that impregnation had lately taken place; "and the evidence would approximate more and more to complete proof as the *size* of the corpus luteum was greater." The *size* of the body discovered ought not to be relied on. It is only by its anatomical characters that the corpus luteum, resulting from conception, can be known. See plate 17, A, fig. 4, where a false corpus luteum, occupying a very considerable portion of the ovary, is depicted.

† It is possible, and even very likely, that two ovules may exist in the same vesicle, and if so, there would appear only one corpus luteum in the ovary, although there were twins in the uterus. But in the multiparient animals a corpus luteum is almost invariably found for every fœtus. Kuhleman (Observ. circa Negotium Generationis in Ovibus Factæ, Lips. 1784), says they correspond precisely. Cuvier also (Leçons d'Anatomie Comparée, 1805, tom. v. p. 59) has, "On y remarke un ou plusieurs corps jaunes, *dont le nombre egale toujours celui des fœtus;*" and De Graaf (De Mulierum Organis Generationi Inservientibus, Lugd. Bat. 1672, p. 297), "Post coitum illis deteguntur *unus aut plures*, prout animal ex illo congressu *unum aut plures fœtus* in lucem edet." Again, there may be more corpora lutea than young within the womb. "It has been shown by Haller, Baer, Montgomery, Allan

On the contrary, the *spurious*, *false*, or *virgin corpora lutea*, as they have been termed,* are of various shapes, sometimes round,

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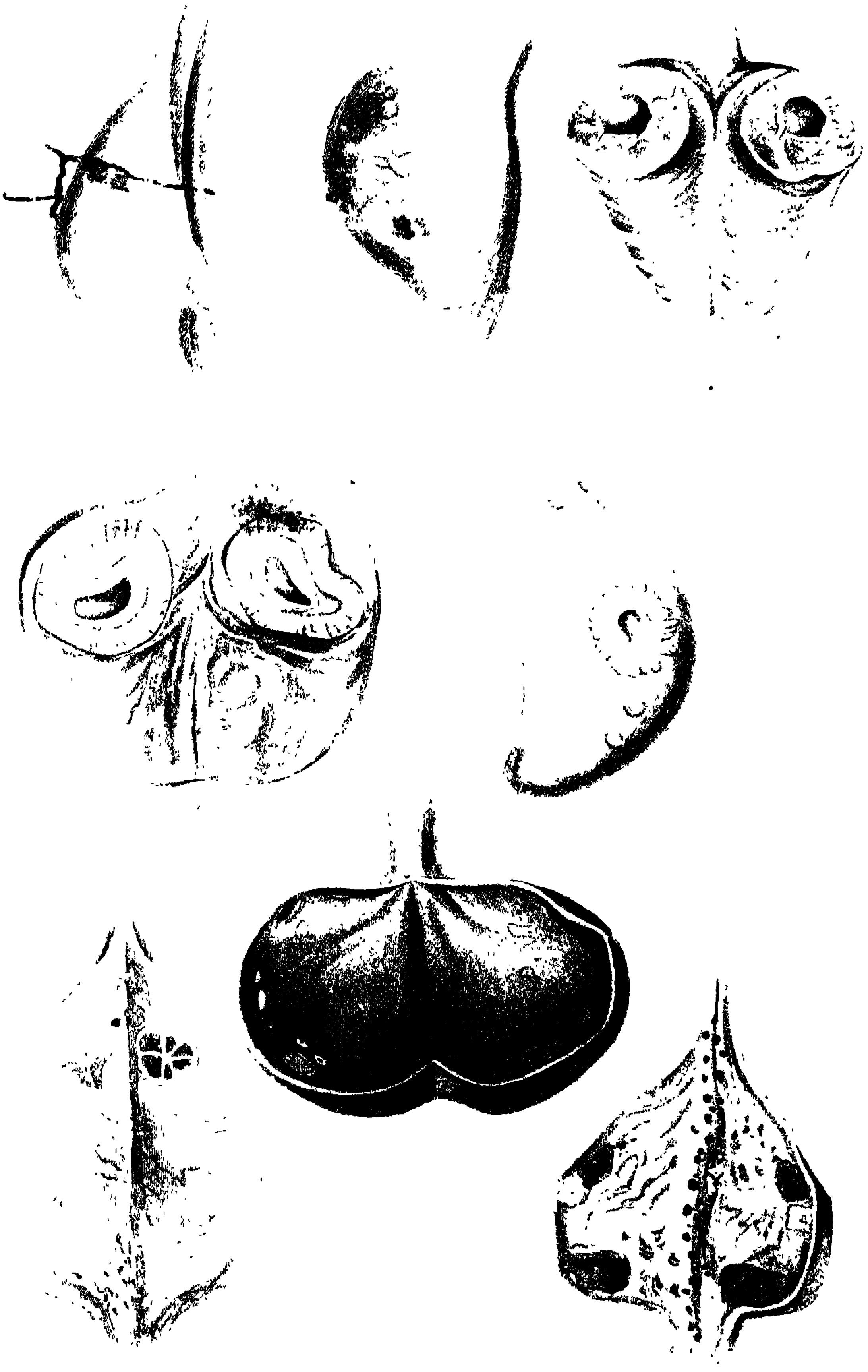
Thomson, and others, that the number of corpora lutea may not precisely correspond, although they in general do so; as when two ovules exist in one Graafian vesicle, of course only one corpus luteum is formed on the impregnation of that vesicle, or when one or more of the ovula are blighted, either before or after their entrance into the uterus, but when they are still so small as not to be easily discovered, unless with the greatest care."—*Paterson's Edinb. Med. and Surg. Journ. Oct.* 1840, p. 403, note.

* The bodies called *false corpora lutea* are produced by many different causes, and result from a variety of actions. Towards the decline of life, the coats of the Graafian vesicles become thickened, shrivelled, puckered, and collapsed, in proportion as their contents have been absorbed. I have known these, as stated in the text, mistaken for the remains of corpora lutea. Tubercular deposits have also been in the same way mistaken, even in children. Not unfrequently effusion of blood takes place into the structure of the ovary, forming an apoplexy of that organ. This, in the recent state, can scarcely be confounded with a true corpus luteum; but when the less solid parts of the blood and the red globules are partially absorbed, a dusky-coloured residuum is left around the centre, which, if the colour alone were to be our guide, might easily lead to an erroneous conclusion. (Plate 17, A, fig. 5.) On them, however, no vessels are to be observed traversing the yellow matter, and no radiated or stellated lines are left as the extravasated blood is being removed. Again, from high vascular excitement of the organ, blood may become effused into the cavity of a Graafian vesicle, and give rise to the idea that there was a fresh deposit, or new formation. But the most common cause, perhaps, is the bursting of a Graafian cyst, the evacuation of its contents, and its subsequently becoming filled with blood, as happens under menstruation. It may now be considered as an established problem, that the opinion which Kerkring promulgated in the Philosophical Transactions, in the year 1672, in the following words — "aliquando fœminæ dijiciunt hæc ova, imprimis tempore menstruorum," is correct;—that during the menstrual period, indeed, in the human female, the whole generative system becomes more turgid than usual;—that the ovaries particularly partake of this turgescence; and that on some, if not on each of these occasions, one or more of the vesicles, being embraced by the fimbriated extremity of the Fallopian tube, burst, evacuate their contents into the cavity of the tube, and become, to a certain extent, filled with blood;—that the more fluid parts are absorbed; and that the solid parts remain, giving origin to a new formation, in some degree resembling the true corpus luteum. See Malpighi for the same idea (Oper. Om. 4to., Lugd. Bat. 1687, pp. 222—224.) This action is similar to what occurs in the lower animal, during the rutting season, or when at heat. Bischoff and Raciborski both nearly at the same time demonstrated the unimpregnated ovum in the Fallopian tube of mammiferous animals (Comptes rendus Juillet 17, 1843); and very recently Dr. Letheby has detected the ovulum in the tube in two unmarried girls, who died during menstruation. His paper on this interesting discovery was read at a meeting of the Royal Society in the year 1851. Thus has been confirmed the suspicion so long



at others triangular, or square, or offering no regular and definite figure (fig. 7). They have no vessels in their substance, and consequently cannot be injected (fig. 8). Although they may possess distinct coats, they are entirely destitute of the rich, interstitial, lymphy deposit. Their texture is often so wanting in firmness, as to be easily broken down. Several are frequently found in both ovaries at the same time. If the mark under examination result from any other cause than the rupture of a Graafian vesicle during the menstrual period, the peritoneum covering it will not present either prominence or any appearance of vascularity, and there will be no external cicatrix. Should it indeed [illegible]ve been formed consequent upon menstruation, to distinguish [illegible] from the corpus luteum of pregnancy will be more difficul[illegible] even in that case the projection is not so striking; —the red vessels ramifying on its surface are fewer and smaller; —and above all, no variety of false corpora lutea ever contains the perfectly regular, central cavity, imbedded in and surrounded by the rich, glandular-like secretion, nor the stelliform or radiated white lines, which result from the closing of the cavity.*

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entertained, that in the human female the maturation of ova and their discharge from the ruptured follicles takes place periodically, at the epochs of menstruation. (See Baly's Supplem[illegible]ler's Physiol. p. 49.) "These false bodies resemble the true corpus luteum, [illegible] an opening, and a cicatrix being produced by the closing of the [illegible]logous to it also, in there existing a cavity from which the contents [illegible]ed; but there is no yellow deposit between the two coats;—if any m[illegible]olour be present, it is within the cavity of the vesicle itself;—there are no blood-vessels permeating [illegible] structure; and there are no radiated or stellated lines: there seems, in [illegible] analogy between the two, except the cavity partially filled, and the aperture through which the contents of the Graafian vesicle have made their way. In plate xvii. A, fig. 4, from Coste's Atlas, the cavity in the ovary, dependent on the escape of a Graafian vesicle soon after menstruation, is clearly depicted; but there is none of the rich interstitial, glandular-like matter present. There is indeed the appearance of a narrow [illegible] structure surrounding the cavity, which seems to be formed of thicken[illegible]es. But these plicæ are more regular than in the true body; they more [illegible] the plaiting or crimping of a shirt frill; and if it be contrasted with figs. 2 [illegible] same plate, the difference cannot but be immediately evident. Gr[illegible]cles may be observed in the ovary; some cut, and some unopened. The [illegible] indeed, of the false body, is often very similar to that of the true. Many of these formations, therefore, in the virgin ovarium, are as much entitled to be called corpora lutea as the true bodies themselves, the consequence of impregnation: and the term which has been so unfortunately chosen to designate the peculiar substance observed in the ovary, after conception has taken place—merely characterising its colour, [illegible] added much to [illegible] that still exists in regard to this subject.

* The drawings in this plate are copied from [illegible]gomery's excellent work on the Signs and Symptoms of Pregnancy, and are of the natural size. Figs. 1, 2, 3, are taken from the ovaries of a woman who died when three months pregnant. Fig. 1 shows the appearance of that which had not contributed to conception; fig. 2, the external surface of the one which had furnished the germ, and which is enlarged by containing the corpus luteum. The vascularity of that portion surmounting the corpus luteum is beautifully displayed. In fig. 3 the same ovary is opened, and shows its internal structure, the lymph effused between the coats, its high vascularity, and its central cavity, which had previously contained the fluid. Fig. 4 is

In advanced life, the ovaries become shrivelled, corrugated on their surface, firmer in their texture, and often contain empty, collapsed cysts, with thickened, opaque coats, so strong that they can be turned out of their bed entire. These have been mistaken for, and described as, corpora lutea; but after the account already given, it must be evident that such is not the case. There is little doubt that they are Graafian vesicles altered by age.

That the ovarium supplies whatever the female provides towards the formation of the new being, is proved by spaying animals, an operation which consists in taking away the ovaries. If one ovary only is removed from a multiparient animal, she becomes less fruitful. J. Hunter reared two sows and a boar of the same farrow, having taken away an ovary from one of the females. He found that the perfect animal bred till she was eight years old, and produced one hundred and sixty-two pigs; while the spayed

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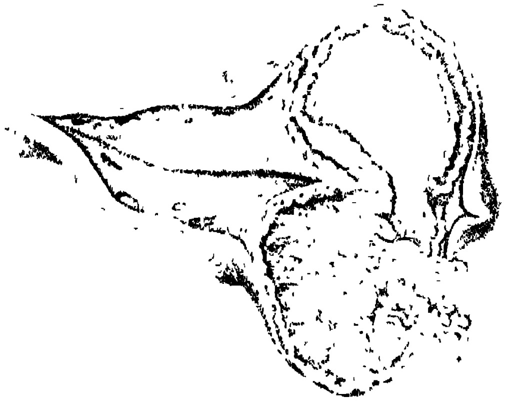
the corpus luteum in the fourth month opened, showing the vessels running through its substance, and the central cavity unusually large for that period of gestation. Fig. 5, the appearance in the sixth month, the corpus luteum still retaining its central cavity, which is unusual at so late a period. Fig. 6, the ovary of a woman who died sixteen days after mature delivery, exhibiting the corpus luteum with its stellated, central, white lines, and a few small vessels in its structure. Fig. 7, an ovary opened, containing spurious or virgin corpora lutea, which possess neither the appearance of a separated double membrane, nor stellated lines, nor any vessels in their structure. Fig. 8 is also an ovary containing spurious corpora lutea. It was injected with care, but none of the colouring matter entered the spurious products, which were destitute of vessels.

The corpus luteum is a formation of such intense interest, as well in a practical as physiological point of view, that I introduced another coloured plate into the third edition of this work (plate xvii. A) illustrative of the subject; that by its assistance I might further demonstrate the distinction between the characteristics of the true corpus luteum, and the appearance of those accidental formations which are so commonly met with, as well in the ovaries of virgins, as of married women. Figs. 1 and 2 are from Coste's Atlas. The first shows the unopened ovary of a woman who committed suicide about the fortieth day after impregnation. The corpus luteum is observed occupying more than half the ovary, the vessels on its exterior numerous, large, and charged with red blood. Fig. 2 displays the same ovary opened, in which may be remarked the bean-like shape and size of the *corpus luteum*, its buffy, yellow colour, and the peculiar arborescent lines, which form one of the grand characteristic marks of the true body, the result of impregnation. There is no central cavity here shown, and probably one did not then exist, although the conception was so recent. Fig. 3 is the representation of an ovary taken from a lady who died under my care, a week after having giving birth to a child at nearly seven months. The Fallopian tube and broad ligament, as well as the ovary, were very vascular. The uterus was highly inflamed, and at one part gangrenous. A true corpus luteum is seen at the upper part of the drawing, the central cavity still existing, and the lymphy deposit between the two coats being very distinctly marked. There are also some other spots to be seen, which are false bodies. Fig. 4, also from Coste, is taken from the ovary of a young girl, who died soon after menstruation. A large cavity is seen in it which contains a light-coloured coagulum; but the mass surrounding the cavity possesses a different consistence from that of the true body, and it has no blood-vessels in its substance. Fig. 5 shows a coagulum of blood effused into the structure of the gland, from the edges of which the red particles have been absorbed, giving rise to an appearance very similar to a true corpus luteum, the chief difference being that the striæ are wanting.



animal left off breeding when she was six years old, and only brought forth seventy-six.* When both these bodies are removed, the subject has no longer any desire for copulation, loses the characteristics of her sex, and assumes more or less those of the male. This is remarked in all animals, but is particularly observable in the feathered tribes. If the ovaries be removed from a common domestic hen, she soon becomes decked with somewhat of the cock's plumage, her voice is changed, and instead of her usual cackle, she utters an imperfect crow. The female of the human subject ceases to menstruate; long straggling hairs grow upon the chin; the breasts become flabby, being deprived of part both of their fat and glandular structure; the skin loses its soft smoothness; the voice becomes harsh and discordant; and the individual might easily be mistaken for a male. Nor are the moral less influenced than the physical properties; sexual feelings are destroyed, and the delicacy of the female character disappears. This change was strictly exemplified in Mr. Pott's celebrated case, where both ovaries were removed in an operation for hernia. Similar results, indeed, take place, as are observed after castration of the male: so that to the presence of these little glands the female is as much indebted for the distinctive physical marks and moral attributes of her sex, as the male is to the possession of the testes.†

Although I have followed the ordinary usage in describing the ovaries as appendages to the uterus, the uterus ought in truth to be considered as an appendage to them; in the same way as the penis may be considered as an appendage to the testes. For they are the most essential organs in the function of generation. The uterus may be diseased to a great extent, and yet the woman may be fruitful; but if both these glands are much altered in structure, barrenness necessarily ensues. An ovary, indeed, or something analogous to it, is found throughout the whole of the sexual genera of both animals and plants.

FALLOPIAN TUBES.—Running along the upper edge of each broad ligament there is a pervious canal, having two open extremities—one end communicating with the uterine, the other with the peritoneal cavities; to these the name of FALLOPIAN TUBES* has been given, after Fallopius, who was the first to publish an accurate description of them. They are about four inches in length; they are covered externally by the peritoneum, possess a middle coat of muscular fibres, which run longitudinally, transversely, and obliquely, and an internal mucous coat, a continuation of the mucous membrane lining the uterus. At the abdominal extremity they are fringed (plate 15 *h*, 18 [illegible] *f f*), and float loose and unconnected;—this part of the tube is called the *fimbriated* extremity, and in old works, from its office, the *morsus Diaboli.* The mucous membrane which lines the tube is continued to the *fimbriæ*, and it is the only instance in the body where a mucous and a serous membrane join by continuation of structure—the only example of a mucous membrane terminating in a shut cavity.

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* On the Animal Economy, Palmer's Ed., p. 51.

† The case detailed by Mr. Pears, (Phil. Trans. 1805, vol. xcv. p. 223) is quite in point. The subject was a female, aged 29, at the time of her death. She had still the appearance of a child; and there were no indications of puberty, either in mind or body. The pelvis had not developed itself;—the breasts and nipples were not larger than the same organs in the male; and the menses had never appeared. These phenomena were explained on post-mortem examination;—for the uterus, though of normal form, had not increased in size beyond the infant state; and (which was, indeed, the cause of the whole of this absence of development,) "the ovaria were so indistinct, as rather to show the rudiments of what ought to have formed them, than any part of their natural structure."

It is through this tube that the ovum, after impregnation, passes into the chamber of the uterus; and the mode in which this is effected is supposed to be the following:—By its own inherent muscular power, the Fallopian tube, under the venereal orgasm, erects itself somewhat like a snake raising its crest. By the same inherent muscular power it directs itself to the ovarium, it widely spreads its fimbriæ, expands itself upon the external surface of the gland, closely embraces it, and squeezes from it the contents of one or more of the vesicles of De Graaf (plate 15 *i*). Freighted with their living burthen, the fimbriæ approximate each other, close the orifice, before wide-spreading and patulous; and a motion somewhat like the peristaltic action of the intestinal canal is then set up in the tube, by which means the ovum, now impregnated, traverses the length of the canal, until it drops into the uterine cavity. We have both negative and positive proof of the strongest kind, that the ovum passes through the Fallopian tube before it arrives at the uterus—*negative*, because there is no other canal through which it can be conveyed, there being no direct communication between the ovarium and the uterus; *negative*, also, because, if we cut away a portion of the Fallopian tube from each side, so as to destroy the continuity of the canals, we prevent conception, although we do not take away the desire for copulation;—but further, we have *positive* proof, because an impregnated ovum has been frequently found within the tube; it has been arrested in its transit, formed a bed for itself within the dilated canal, and there grown; constituting a species of that disease termed *extra-uterine conception.* Thus we cannot for a moment doubt that the ovum travels along the Fallopian tube to gain the uterine cavity. The sensation communicated to the

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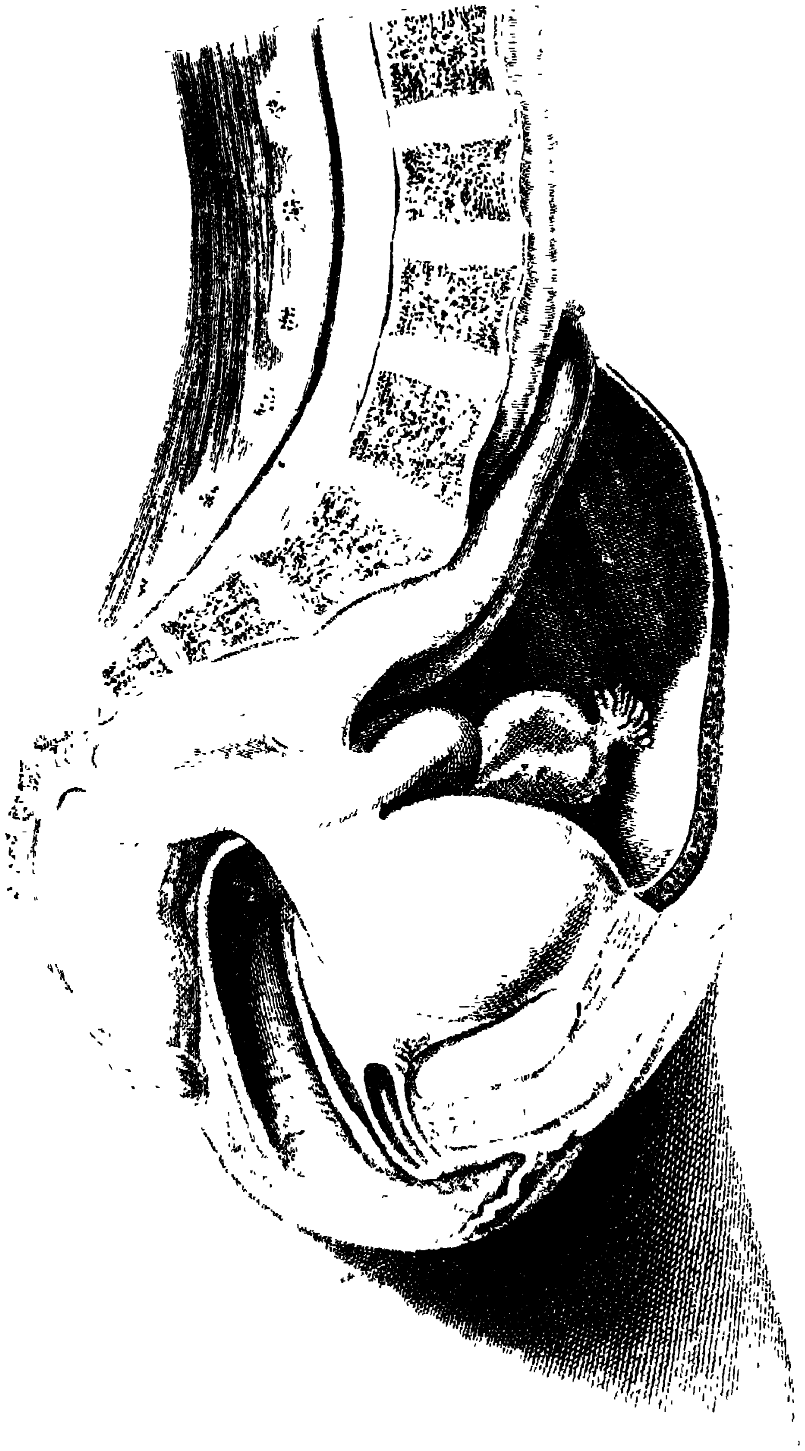
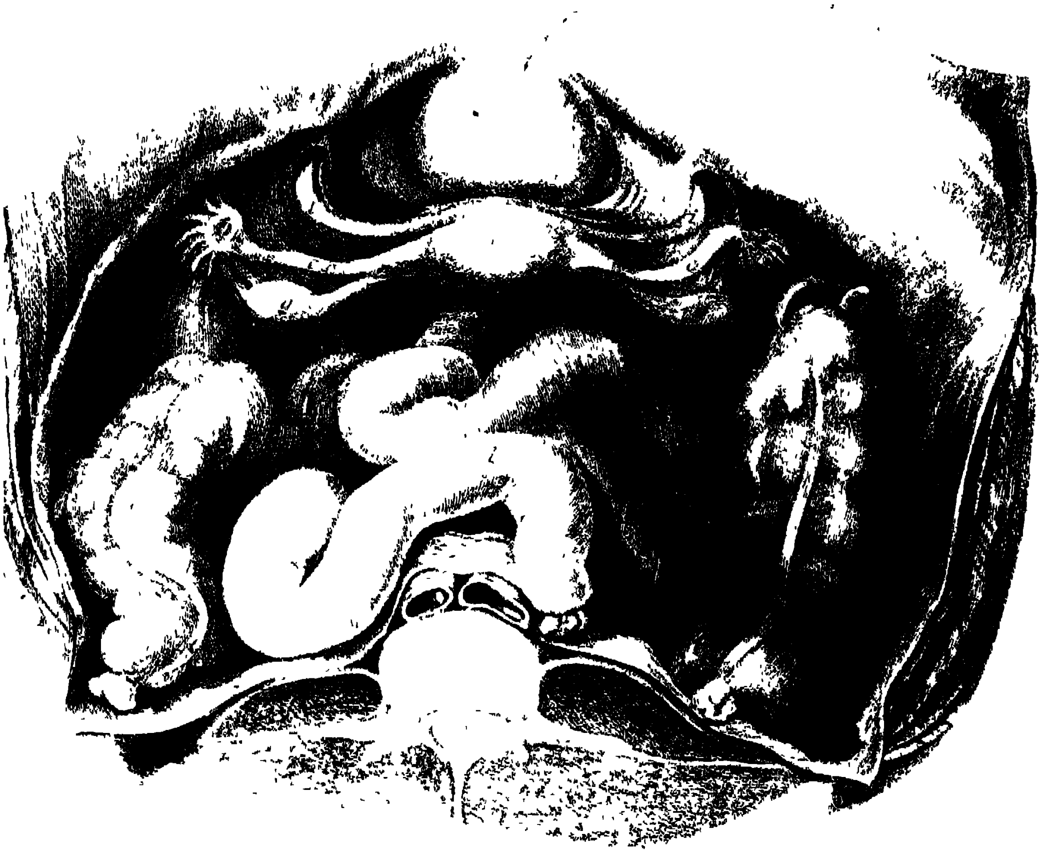
* Or Fallopian trumpet,—*tuba* signifying a trumpet.





finger by squeezing the tube is very much like that of the spermatic cord. It is hard, firm, and wiry. In its office it may be assimilated to the vas deferens of the male.

THE ROUND LIGAMENTS are two small circular cords, which, arising from the angle of the uterus at its sides, anterior to and rather below the Fallopian tubes, run between the duplicatures of the peritoneum, constituting the broad ligaments, until they arrive at the sides of the pelvis. They then leave the broad ligaments, and, turning forwards, take their course round, just below the brim, behind the peritoneum, traverse the inguinal canal, like the spermatic cord in the male, eventually pass out at the ring of the external oblique muscle, and are lost in the groin and parts adjacent. They consist of a congeries of blood-vessels, nerves, and absorbents; and by them a communication is kept up between the uterus within the pelvis, and the structures on the outside. It is in consequence of this direct communication, that, in some of the malignant diseases of the uterus, the glands in the groin take upon themselves unhealthy action, and become enlarged, indurated, and occasionally ulcerated.

The round ligaments are figured in plate 15 *f f*, and particularly well shown in plate 19 *i i*, where their origin, course, and escape through the ring may be clearly traced: one is also distinguishable in plate 18 *p*.

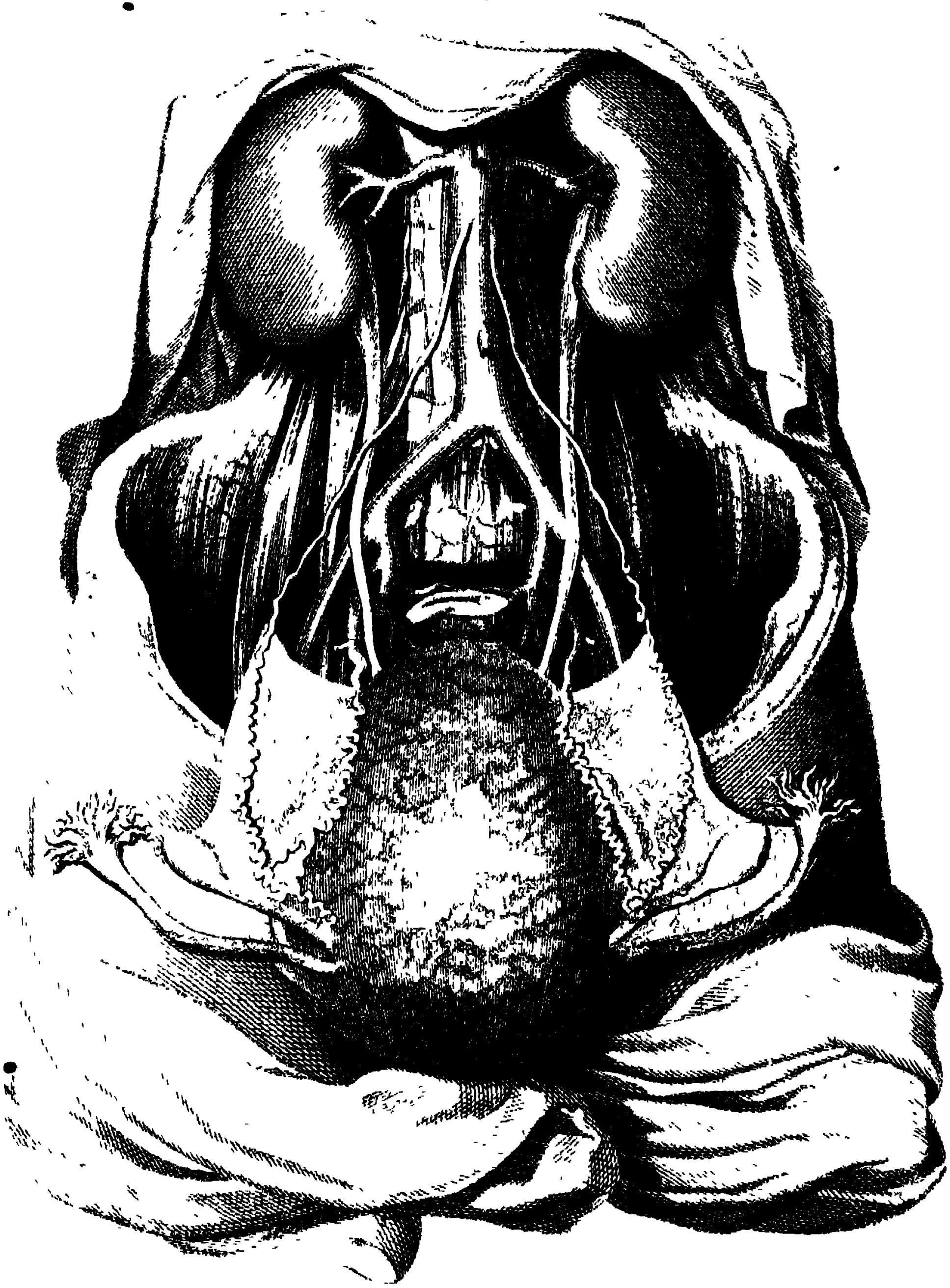
Plate 15 shows the back face of the vagina, the uterus, and its appendages. On the left side, the peritoneum is dissected off the body of the uterus, to display the round ligament more fully. The fimbriated extremity of the left Fallopian tube is spread upon and embracing the ovary of that side, as happens during conception. *a* the fundus uteri, *b* its body, *c* the neck, *d* the mouth, *e e* the broad ligaments, *f f* the round ligaments, *g g* the Fallopian tubes, *h* the fimbriated extremity of the right side, *i i* the ovaries, *k* the vagina split up, to show the rugæ on its posterior surface.

Plate 18 represents the left section of the female pelvis, drawn from a very accurate German model in my collection. *a* the fourth lumbar vertebra, *b* the rectum, *c* the left iliac fossa, *d* the rectus abdominis muscle, springing from *e* the symphysis pubis, *f* the mons veneris, *g* the clitoris, *h* the left nympha, *i* the left labium externum, *k* the fundus uteri, *l l* the ovaries brought upwards, *m* the posterior surface of the right broad ligament, *n* the right Fallopian tube turned downwards, *o o* the fimbriated extremities of the tubes, *p* the right round ligament—the dotted line crosses the fundus of the bladder, *q* the os uteri, *r* the vagina, *s* the point of the coccyx, *t* the sphincter ani, *v* the sphincter of the bladder, *w* the urethra—the dotted line crosses the perineum, *x* the meatus urinarius.

Plate 19 gives a good view of the flooring of the pelvis looking into it from the abdomen; it is taken from a cast also in my collection, modelled by the late Mr. Joshua Brookes. *a* the mons veneris, *b* the bladder, *c* the fundus uteri, *d* the rectum, *e e* the Fallopian tubes, *f f* their fimbriated extremities, *g g* the ovaries brought upward into view, *h h* the posterior processes of the broad ligaments, *i i* the round ligaments running forwards to escape out of the pelvis at the ring, *k* the cæcum with its appendix vermiformis, *l* the small intestines, *m* the body of one of the lumbar vertebræ.

ARTERIES.—Plate 20 delineates the arteries of the uterus; it is copied from one of Tiedemann's beautiful engravings. The patient from whom the drawing was taken died six days after mature delivery. *a a* the kidneys, *b b* the ureters, *c* the uterus, about the comparative size it is usually found six days after labour; it is turned forwards over the pubes, so that its posterior face is brought into view: *d d* the broad ligaments, *e e* the ovaries, *f f* the Fallopian tubes, *g* the rectum cut, *h* the aorta, *i* the superior mesenteric artery divided, *k* the inferior ditto, *l l* the renal, *m m* the common iliacs, *n n* the external ditto, *o o* the internal ditto, *p p* the uterine arising from the internal iliacs, *q q* the gluteal, *r r* the obturators, *s s* the internal pudic, *t t* the ischiatic, *u u* the lateral sacral, *w w* the circumflexa ilii, *x* the sacra media, *y y* the spermatics, arising from the aorta just below the renal; in this instance, as is most common, by two distinct branches.

THE NERVES particularly requiring our attention run in five divisions. 1st. There is a large cutaneous branch, which rises from the second and third lumbar nerves, traverses the iliac and psoas muscles, and, following the spine of the ilium, is expended on the integuments of the outer part of the thigh. This nerve is too high to suffer under labour, but it is liable to pressure during the last few weeks of pregnancy; the consequence of which is numbness in the track of its distribution. 2nd. The anterior crural nerve,—one of great magnitude,—takes its origin from the second, third, and fourth lumbar nerves, passes over the pelvic brim outside the femoral artery, to be distributed principally on the rectus femoris, and other flexors of the thigh. It is also out of the way of pressure under labour, but, like the cutaneous branches, may suffer towards the close of gestation, to such an extent as to produce cramp on the inner and fore parts of the thigh. 3rd. The obturator, which rises from the third and fourth lumbar nerves, runs round below the brim of the pelvis, and passes out at the upper part of the obturator foramen. This is chiefly distributed to the adductor muscles of the thigh, and pressure on it sometimes occasions cramps on the inside of the thigh, at the commencement of labour, while the child's head is entering the brim. 4th. The great sciatic, the largest nerve in the body, is



formed of the fourth and fifth lumbar, and the first, second, and third sacral nerves. It lies over the sacro-iliac symphysis, and passes out of the pelvis by the side of the pyriform muscle, through the large sacro-sciatic foramen, to be distributed to the posterior part of the thigh, and to supply the leg and foot. This nerve, situated at the back part of the pelvic cavity, and passing directly through it, is particularly exposed to pressure during child-birth; and it is not surprising that much inconvenience should result. Violent cramps in the extensor muscles of the thigh, and especially in the calf and plantar sole, are almost universally attendant on lingering labours, and often, also, on those of ordinary length, during the time when the head is fully occupying the pelvic cavity. Such muscular spasms add much to the agony endured: they may sometimes be mitigated by pressure and hard friction over the part in pain. 5th. The fourth sacral is entirely expended on the part within the pelvis and about the anus. The fifth is sometimes wanting, and is always very small. The pudic nerve which supplies the clitoris and other external organs is derived from the third sacral.

Thus, when first the uterus subsides, preparatory to its taking on expulsive action, the cutaneous and crural nerves suffer, causing numbness and pain in the fore and outer part of the thigh: when the head is passing through the brim the obturator may be pressed on, producing cramps on the inside of the thigh; when labour is well advanced, the sciatic can scarcely escape pressure; and more or less of cramp at the back part of the thigh, the calf of the leg, and sole of the foot, is the consequence. Occasionally, indeed, lameness and partial paralysis continue for some time after. The varicose state of the veins, and anasarcous swellings of the lower extremities, so common during pregnancy, also originate from pressure, and mostly disappear, or are much relieved, in a few days after the termination of the labour.

Plate 21, from Moreau's work, faithfully describes the course and distribution of the principal pelvic nerves; it is drawn from the body of a woman who died four days after labour. The left side of the pelvis is cut away, the division being made at the sacro-iliac symphysis, posteriorly, and at the ramus of the pubis in front, just at its outer extremity, before it divides into the two branches, horizontal and descending. The bladder, collapsed, is seen behind the pubis, the vagina and rectum are also well displayed, as is the uterus, large, from having so recently expelled a fœtus. The left ovary is drawn up, and the Fallopian tube foreshortened, to give a view of the spermatic vein *a*, and the spermatic artery *b*; *c* directs to the vena cava, *d* the aorta; *e e* cut portions of the inferior mesenteric nerves, branches of the great sympathetic; *f g* the fourth and fifth lumbar ganglia; *h i k* the first, second, and third sacral; *m m m* the lumbar and sacral nerves cut, which are to form the great sciatic; *n* a branch supplying the lower part of the rectum, which rises from the fourth sacral. Immediately below the bifurcation of the aorta, lying over the sacral promontory, a large plexus of nervous filaments is seen, which is called the superior hypogastric, or common uterine plexus; this is formed by the continuation of the inferior mesenteric nerve, and by branches from the lumbar ganglia; it chiefly supplies the uterus. On the side of the vagina, rather above its centre, there is visible another extensive plexus of nervous threads, spread out into a large number of irregular meshes; this is also formed from branches sent off from the inferior mesenteric, and others from the lumbar and sacral ganglia, and from the sacral nerves, and supplies the upper part of the vagina and the lower portion of the uterus: this is the inferior hypogastric plexus. Branches arise from the lower sacral nerves, *m m*, to be distributed on the bladder, and lower part of the vagina,- the vesical and vaginal nerves. Behind these nerves, and the inferior hypogastric plexus, the uterine artery may be observed running up the vagina, and giving off transverse branches to that organ. The pudic nerves are not shown here. It is evident, that since they emerge from the pelvis, and re-enter it, the pudic nerve on the side opened must be destroyed, when the pelvis is divided as this plate represents.*

THE MUSCLES WITHIN THE PELVIS deserve notice; for, by being pressed on during the escape of the child's head, they are sometimes strained, and pain is experienced in moving the thigh, and in evacuating the rectum, for some days subsequent to labour. *The levator ani*, one on each side, of the shape of a fan, rises from the pubis just below the brim, the aponeurosis covering the obturator internus, and the spinous process of the ischium, passes down by the side of the vagina, and is inserted into the sphincter ani, as seen in plate 21. On dissecting away these fibres, we observe the *obturator internus;* which, taking its origin from the inner surface of the obturator ligament, and a portion of both the pubis and ischium in the neighbourhood of the foramen, sends off a tendon that, running round the ischium like a pulley, passes out of the pelvis through the small sacro-sciatic foramen, and is

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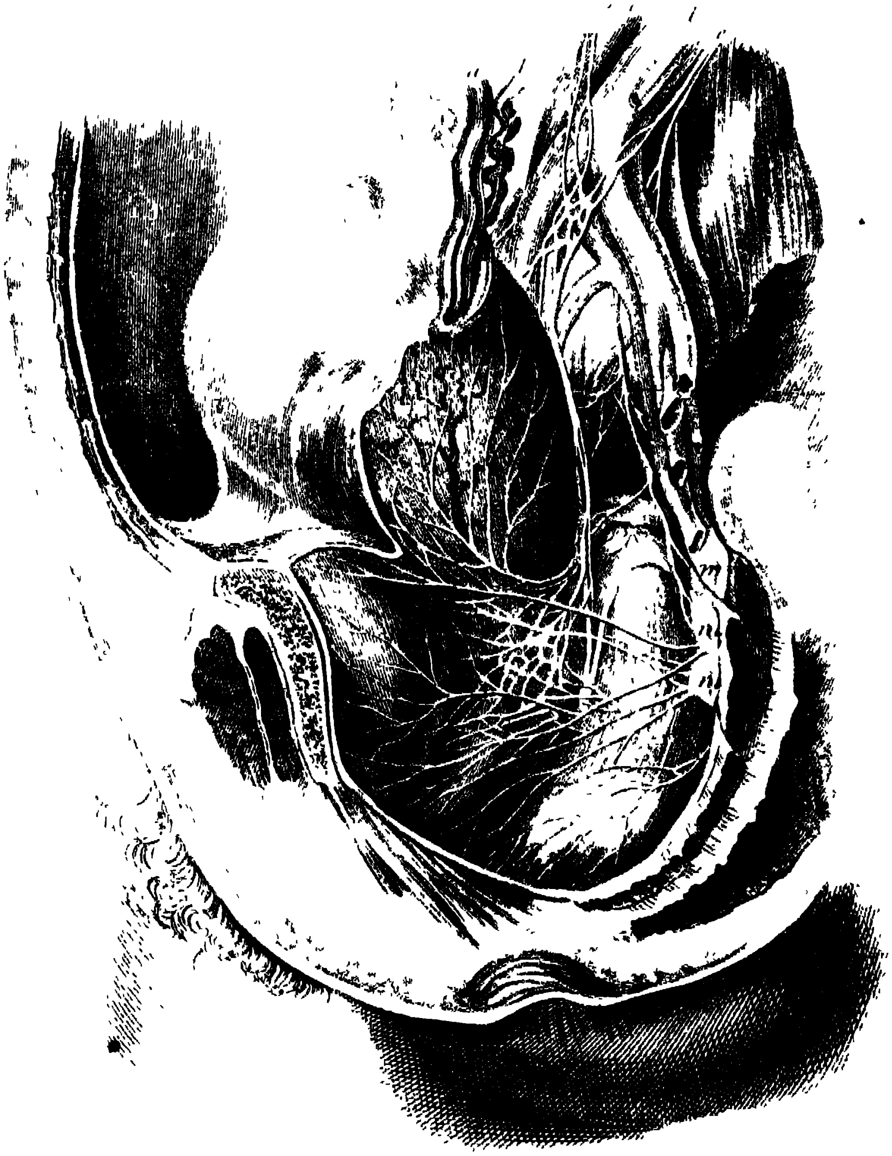
* For a more minute description of the uterine system of nerves, I would refer my reader to Dr. Robert Lee's excellent papers read before the Royal Society, on Dec. 12, 1839, and June 17, 1841; and published in the Philosophical Transactions. The illustrative plates are taken, two from an uterus in the fourth month, and the other at the end of the ninth month of pregnancy. He there describes four great plexuses under the peritoneum, having an extensive connexion with the hypogastric and spermatic nerves, and beautifully displays an amazing number of filaments, with which the uterus and contiguous organs are supplied. These papers have been published separately, as they well deserve to be.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inserted into the fossa trochanterica at the root of the trochanter major. *The pyriformis* rises from the anterior surface of the second, third, and fourth divisions of the sacrum, escapes from the pelvis through the large sacro-sciatic foramen, and is also inserted into the fossa trochanterica, near the insertion of the obturator. *The coccygeus* springs from the spinous process of the ischium, and is attached to the side of the coccyx through nearly its whole extent. *The transversus perinei* rises from the side of the tuber ischii, and is lost upon the sphincter ani, sphincter vaginæ, and the structure of the perineum itself.

Analogy between the Genital Organs in the two Sexes.—Although the organs of generation appear to be widely different in the two sexes, and indeed give them their distinctive characters; yet there is seen, on closely comparing them, a great similarity, not only in function, but even in formation; so that we cannot withhold our belief that they have both been fashioned on a common model. The resemblance between the ovaria and testes in office, form, organic elements, and original situation is most striking. For the testes lie in the abdomen until about seven months of fœtal life are passed, and they are both supplied by blood-vessels arising from the same source, and following the same track. The uterus has been likened to the prostate; and it certainly bears a great similitude, in its position at least, during fœtal life. The vasa deferentia and Fallopian tubes resemble each other in function and construction. The clitoris may be likened to the penis, and the labia to the scrotum. In many instances the confusion arising from this similitude is so remarkable that it is difficult to decide, particularly in infancy, to which sex the individual belongs. It must be observed, indeed, that the earlier the time chosen for making the comparison, the stronger will the resemblance be. The clitoris of a fœtus of three months is as large as the penis of a male at the same age; and at a more recent period [illegible]ra-uterine existence the distinction of sex is by no means perceptible.

OF THE GRAVID UTERUS.

Contrast between the unimpregnated and gravid Uterus.—When we compare the unimpregnated with the gravid uterus at the end of gestation, we should be inclined to doubt,—from the extraordinary alteration that has taken place during pregnancy,—whether in reality they were not two perfectly distinct organs. We observe an amazing difference, indeed, in every essential attribute, particularly in *form*, *size*, *situation*, *texture*, *power*, and *contents*.

THE FORM has undergone great change: previously to impregnation it is somewhat triangular, or like a slightly compressed pear; at the end of gestation it is of an egg shape.

The alteration in SIZE is most remarkable; the virgin uterus measures not more than three inches in length, and two in breadth;* when labour is near at hand, it is about thirteen inches long, and eight or nine across.

The unimpregnated uterus has been described as SITUATED WITHIN THE PELVIS, between the bladder and the rectum, sustained in its position by ligaments passing from it to the pelvic and lumbar bones. On the contrary, the gravid uterus has become an abdominal viscus; it fills a large portion of that cavity, stretches the muscles considerably, and is supported by the parietes in front and at the sides, and by the pelvic bones below.

THE TEXTURE of the unimpregnated uterus is close, tough, firm, and inelastic; the structure of the organ when gravid is loose, spongy, and distensible, capable of being drawn out to a considerable extent between the fingers without laceration of its substance. The looseness of its texture depends chiefly on the enormously increased size which its vessels have acquired during the development of the organ.

The unimpregnated uterus possesses no POWER but that of secreting and assisting in the function of conception; the gravid womb possesses the power of affording lodgment to the embryo, nourishing, and eventually expelling it.

The section of the unimpregnated uterus displays an unoccupied cavity, communicating by an open mouth with the vagina below, having, therefore, properly speaking, no CONTENTS; while the gravid contains the *membrana decidua*, and the *ovum;* which latter consists of the *chorion*, the *amnion*, the *liquor amnii*, the *placenta*, the *funis umbilicalis*, the *fœtus*, and, in an early stage of pregnancy, the *vesicula umbilicalis*, and *allantois*.

On opening the gravid uterus, besides the spongy character of its structure just adverted to, and the large size of its vessels, (which have acquired such a magnitude, that the veins have the term *sinuses* applied to them,) its thickness must necessarily become an object of observation. This varies considerably in different dividuals; the substance is generally rather thicker than in he unimpregnated state; and in all instances the fibres are more apparent. The nerves and absorbents also enlarge in size, nearly, if not entirely, in the same proportion as do the arteries and veins.

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* "According to the calculations of Levret, its superficies may be taken at sixteen inches, but at the end of the ninth month of gestation, its length is from twelve to fourteen inches, its breadth from nine to ten, and from back to front from eight to nine inches; its superficies is now estimated at about three hundred and thirty-nine inches, and its cavity, which before impregnation was equivalent to about three-fourths of a cubic inch, will now contain four hundred and eight, so that its capacity is increased a little more than five hundred and nineteen times, and its solid substance from four and one-third to fifty-one cubic inches, or nearly in the ratio of twelve to one."—Montgomery, Signs and Symptoms of Pregnancy, p. 3.

Having completely divided the parietes, we cut down upon the MEMBRANA DECIDUA OR CADUCA.* This is an opake membrane, lining the entire cavity, and in contact with the internal surface of the uterus throughout its whole extent. It is divisible into two layers, both together being not much thicker than the nail, and is flocculent on that face which is attached to the uterus; † smooth and plane on the one next the ovum;—so glossy, indeed, that it might be supposed to possess serous properties. But the most patient investigators have not been able to discover any formation in the decidua analogous to serous structure. It is highly vascular, partakes largely of the character of false membrane, is supplied with blood from the uterine vessels, and has a tenacity between true and false membrane. In the early period of pregnancy, the two layers are separated from each other, especially towards the fundus uteri, by a quantity of red-coloured fluid, partly serous, and partly half-coagulated, to which Breschet, who designates it sero-albuminous, has given the name of *hydroperione*.‡ As gestation advances, this fluid is gradually absorbed, and the two laminæ come into close contact at every point, except where the placenta intervenes between them. For they are described by Hunter as splitting at the edge of the placenta; one layer passing between it and the uterus, the other traversing the fœtal face of the organ, being interposed between the substance of the placenta and the chorion.§

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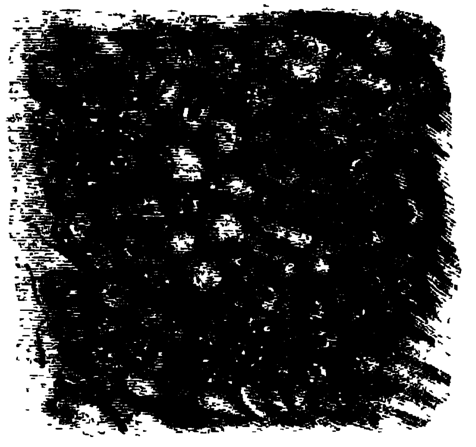
* These names were given to the membrane by Dr. Hunter, (who was the first to demonstrate its two laminæ,) in consequence of its being shed from the uterus after labour, with the other discharges. He also called the outer layer the *decidua vera* and the inner *decidua reflexa.* I prefer the terms suggested by Baillie (Hunter's Gravid Uterus, p. 80, note), *decidua uteri* and *decidua chorii or ovuli;* because their adoption merely describes the situation and connexion of the two laminæ, and does not involve any theory as to the formation of the inner layer, about which there is still considerable doubt. It has been described by Chaussier under the title *epichorion,* from ἐπὶ, above, and χορίον, the external ovular membrane; by Dutrochet *epione,* from ἐπὶ and ὠὸν, the ovum; by Breschet *perione,* from περὶ, around, and ὠὸν: and by Velpeau *anhiste,* from ἀ priv., and ἱστὸς, a web. Velpeau uses this term to signify an inorganic substance, since he denies the organization of the membrane at any period of pregnancy.

† "In thickness the membrane sometimes equals from one to three lines." (Muller's Phys. p. 1472.) This describes the thickness of the membrane in early pregnancy; it is thinner towards the close.

‡ From ὕδωρ περὶ ὠὸν, the water around the ovum.

§ Dr. Wm. Hunter, (Anat. Description of the Human Gravid Uterus, p. 54); see also Dr. Baillie's account in the note at the same page; as well as in page 81 of the same work. Breschet (Etudes de l'Œuf dans l'espèce humaine) states that both



The annexed cut, taken from Montgomery's work, displays the appearance of the uterine surface of the decidua in an early ovum, magnified by the microscope. The cup-like elevations, having the appearance of little bags, which Montgomery has called the *cotyledons of the decidua*, and which he likens to the suckers of the cuttle-fish, are well made out. He found on more than one occasion a milky or chylous fluid within their cavity.*

The deciduous membrane is a product of the uterus, and does not originate in the ovum. It is not a constituent part of the ovum, and is only connected with and subservient to the embryo as an uterine formation, the consequence of pregnancy. This is proved to be the case because, in extra-uterine gestation, although the ovum has never entered the uterus, this membrane is invariably formed within the uterine cavity.† It is furnished by the tubular follicles opening upon the mucous membrane of the uterus, described and delineated in page 40,‡ and its secretion commences immediately upon impregnation taking place; so that even before the ovum can be discovered by the naked eye,—while it is yet traversing the Fallopian tube—the rudiments of the decidua may be found within the womb. At first it consists of an albuminous fluid; § and by degrees it assumes the character of a perfect, organised, tender membrane. E. F. Weber || observed it

layers pass between the uterus and placenta. The two layers of the deciduous membrane are well shown in plate 22, fig. 3. This ovum is about seven weeks old: *a* the decidua *vera*, or *uteri*; *b* decidua *reflexa* or *chorii*; *c* chorion; *d* amnion; *e* funis umbilicalis; *f* embryo; *g* prolongation of the decidua uteri into the neck of the womb. In this specimen the inner layer of the decidua forms a shut sac, and there is no appearance of any prolongation of the outer layer into either Fallopian tube, nor of any apertures tallying with the commencement of the tubes; although it is indubitable that such a prolongation exists at the commencement of pregnancy, as asserted by Baillie (Op. Citat. p. 79). This preparation fully bears out Baillie's description in the note at the same page. "The decidua vera [uteri] seems to lose itself at the beginning of the cervix, and has evidently there an opening; the decidua which covers the external surface of the chorion (decidua chorii) becomes gradually thinner as pregnancy advances, but has no opening in it at the cervix uteri, nor anywhere else." Fig. 2 shows the flocculent character of the surface of the membrane in contact with the uterus. Fig. 1, the smooth glossy face next the ovum. This piece of deciduous membrane was taken from an ovum of later date.

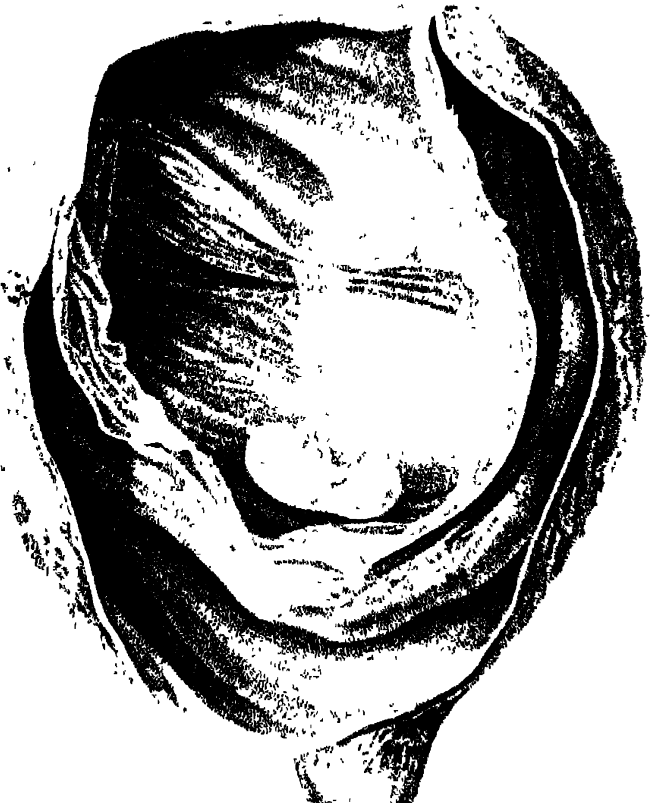
* Op. Cit. p. 134, note.

† See note on this subject in the paper on extra-uterine fœtation in this work.

‡ Weber and Sharpey, in Müller's Physiolog., p. 1474; also Dr. J. Reid eod. Opere, p. 1580.

§ Wagner's Physiology of Development, by Willis, p. 183.

|| Disq. Anat. Uteri et Ovar. puellæ vii. a concept. die defunctæ. Halæ, 1830



on the seventh day from coitus: it then resembled a layer of lymph. This is the earliest period at which it has been seen to have assumed a solid form.*

Hunter called the internal layer *decidua reflexa*, from the supposition that its production was the effect of the following process. He presumed that on the impregnated ovum arriving at the uterine extremity of the Fallopian tube, it meets with resistance from this membrane, lying stretched across the mouth of the tube; that in its descent into the cavity, it carries the membrane before it, doubles it upon itself, and thus forms two layers from the original single one. Other physiologists of repute have also adopted Hunter's ideas; and some† have described a third membrane, called from its later formation the *decidua serotina*. This is said to be secreted exactly at that point where the integrity of the decidua vera as a symmetrical sac is interrupted and destroyed by its separation from its uterine attachment, and inversion towards the uterine cavity. A part of the ovum is thus left uncovered by the membrane; but the place of the protruded and detached portion of the membrane is supplied by the *decidua serotina*, which becomes connected by its margins with the decidua vera in the manner of a patch. By this explanation the followers of Hunter's views account for the prolongation of the membrane having been frequently observed passing a little way into each Fallopian tube, which could not be the case if the inner were a reflected membrane, without some arrangement similar to the one contended for.‡

The value of the decidua is principally, if not entirely, confined to the first few weeks of pregnancy; it would appear to be of little service towards the close.

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* Sharpey and Weber (Muller's Physiol., p. 1579), together with Baly (Supplement to that work, p. 91), think the decidua not a structure of new formation, but that it is simply the mucous membrane of the uterus in an increased state of development and vascularity; so, also, does Prof. Goodsir (Anat. and Pathol. Observ. p. 58). Many continental physiologists, as Coste (Comptes Rendus, May 24, 1847, p. 693), and Robin (Mémoire sur la Membrane Muqueuse Uterine, Paris, 1848), have adopted this opinion. On the contrary, Müller (Op. Cit. p. 1573) declares that the decidua differs totally from the mucous membrane of the uterus, and that the two layers are, in fact, new products.

† Muller's Physiol., p. 1573; Wagner on Development, by Willis, p. 192. Bojanus originated this doctrine. Isis von Oken, für 1821.

‡ There is even now considerable difference of opinion existing as to whether the internal deciduous membrane is a reflected layer or not. Goodsir (Anat. and Pathol. Obs. Edinb.), Coste (Comptes Rendus, 1842), Robin (Mém. sur la Membrane Muqueuse, 1848), and others denying that it is so; while Weber, (Frorieps N. Notizen, 1842, No. 507, p. 35,) Müller, (Phys. by Baly, p. 1573,) and I think most who have paid particular attention to the subject, look upon it as an extension of the originally formed membrane doubled upon itself. Müller says, indeed, (Physiol. p. 1573,) "It must not be imagined that the process by which the decidua reflexa is formed is a mechanical one,—that the ovum as it enters the uterus pushes the membrane before it,—for, like all processes of the same kind which occur in the animal organism, this one is effected by the vital vegetative action, exerted in a determinate direction."

It is subservient both to the nutrition of the embryo, and to the preservation of its vitality; and thus before the elaboration of the placenta, it seems to perform for the new being, functions analogous to those which, in an after stage, are carried on by the placenta itself.

As gestation advances, the deciduous membrane becomes thinner and less tenacious; and at the full period of pregnancy it is very difficult to separate the two layers one from the other.

CHORION.—Having divided the decidua in our dissection, we arrive at the external membrane of the ovum, the CHORION;[*] a thin, glistening, transparent membrane, much resembling the delicate serous tissues, very tough for its tenuity, enveloping and affording an external covering to the whole of the ovum, with the exception of the placenta, which is interposed between it and the uterus. It passes on the fœtal face of the placenta, and gives a coat to that surface as well as to the funis umbilicalis.

It is a constituent part of the ovum from the remotest period of conception, because in extra-uterine pregnancy we find it, not in the uterus, as the deciduous membrane is, but enclosing the embryo itself. It possesses no blood-vessels evident to the naked eye; but we cannot deny its vascularity, since it is subject to become thickened and opake by disease; and in some of the mammalia its vessels may be made apparent by injection.[†] It is for the purpose of protecting the embryo in conjunction with the amnion, and of assisting to form both a bag for containing the liquor amnii, and also a soft wedge by which the structures, during labour, may be dilated with the least possible chance of injury.

When the ovum is first seen, it is completely surrounded by a thick *tomentum* of minute filamentous, mossy villi, as with an efflorescence, which, conveying the embryonic vessels,[‡] proceed from the chorion, and imbed themselves in the semi-fluid deciduous secretion, like roots in the soil; these have been called the *shaggy chorion*.[§] As the ovum continues to grow, the chorion

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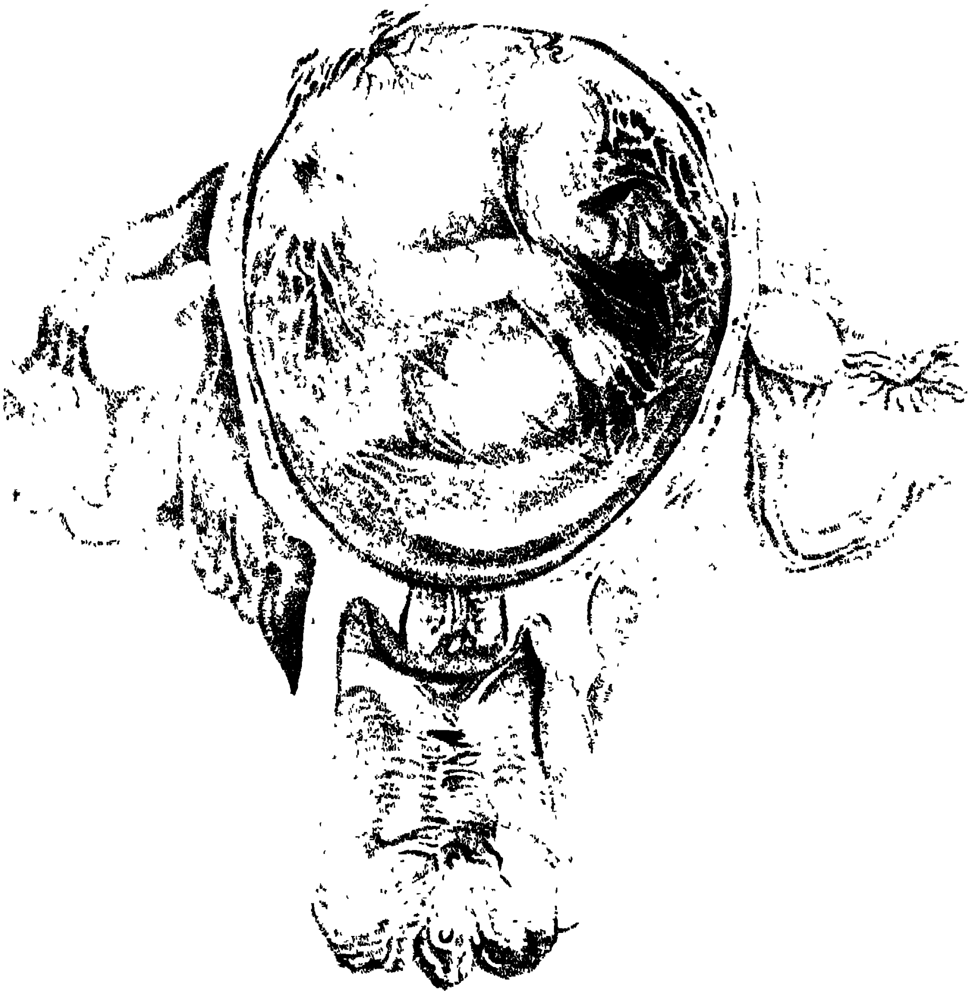
[*] This membrane has its name from the thick fringe of villous excrescences springing from its outer surface, from χορὸς, a band or collection of anything.

[†] "In all cases in which the allantois applies itself upon the other membranes of the embryo, it furnishes them with vessels, so that in the pachyderms, ruminants, and carnivora, in which the allantois is thus disposed, the amnion and chorion are at a certain period richly supplied with vessels." (Baly, Continuation of Muller, p. 88.)

[‡] Wagner, Op. Cit. p. 200.

[§] W. Hunter (Gravid Uterus, p. 53) calls these villi "shaggy vessels;" and says that with a magnifier they appear to be transparent ramifying vessels. Burns (Principles of Mid. 5th edit. p. 164) follows Hunter in describing them as "shaggy vessels." Baillie also (Hunter's Grav. Ut. p. 81) designates them as the "shaggy vessels of the chorion;" and says, probably some of them are lymphatics. Velpeau, Carus, and Breschet, think that they are not blood-vessels, because they cannot



and amnion increase in extent, but the flocculent villi do not increase in the same proportion. They now no longer surround it at all points, but are left, as it were, in one corner, and gradually become clustered together and concentrated, to form the fleshy placenta;[*] while the remainder of the enlarging ovum becomes as gradually invested with the bald, naked, pellucid chorion; and this coat in its growth is carried onwards, around, within the lining membrane of the uterus, to afford an outer covering to the fecundated cyst, so long as gestation lasts.[†]

Plate 23, fig. 1, shows the villous tomentum entirely investing the chorion. Fig. 2 *a* the same villi, thicker and more numerous at this point than at any other: they are being collected, by degrees, into one mass, for the formation of the placenta; *b* the chorion denuded of the villi. Fig. 3 *a* the pellucid membranes, which have increased in extent, leaving the villous prolongations collected into one mass, to form *b* the placenta; *c* the embryo seen through the membranes.[*] This ovum is about eight weeks old, and is the most perfect specimen of so early a placenta I have yet seen. The drawing represents the appearance of the ovum when it was first expelled, distended with the amnial fluid.

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detect canals in them, even by powerful glasses: and Dr. Montgomery, in a paper in the 4th volume of the Dublin Medical and Surgical Journal, says, "They seem to be merely spongioles, and to act as suckers, by which the ovum is supported until its connexion with the uterus is more perfectly accomplished by the development of the vessels of the placenta." So also J. Goodsir (Anat Obs. p. 56):—"The villi are to the ovum what the spongioles are to a plant." And he says, "Up to a certain period of gestation, the chorion and its villi contain no blood-vessels." These vessels indeed are first visible soon after the allantois arrives at, and applies itself to, the inner surface of that portion of the chorion, towards which it travels in its growth. The villi may, therefore, be regarded as conduits for those blood-vessels by which the embryo at this particular stage of gestation is sustained and nourished. Dr. Mackenzie, of Glasgow, in an excellent article in the Edinburgh Medical and Surgical Journal for January, 1836, maintains, that although the villi themselves are not blood-vessels, yet they form the placenta, and are each furnished with an artery and vein that run side by side along them. And this indeed seems to be a true description of their anatomy. For modern microscopical research has shown that they are not themselves either blood-vessels or lymphatics, but the framework on which blood-vessels travel from the ovum to the uterus,—that framework being a very fine process of the transparent chorion, which envelopes each loop, as in a slender bag, and conducts it to the deciduous membrane, in which it ultimately fixes itself firmly. They are very similar to the vascular tassels attached to the fœtal membranes which dip into the cups of the cotyledons in the gravid uterus of the cow and sheep, and which in those animals are most easily injected from the umbilical vessels.

[*] Wagner, p. 168, note; see also p. 199.

[†] That these villi are not removed by absorption, as Velpeau (Embryologie Humaine), and some other physiologists have supposed, but are persistent and themselves, as Lobstein (Sur la Nutrition du Fœtus, § 19,) and Mackenzie, (Edinb. Med. Surg. Journ. vol. xlv. p. 45) believe, form the placenta is, I think, proved to demonstration, by the fact that in the *feræ*, who possess an annular placenta of a broad belt-like shape surrounding the ovum, there is discovered, in the early stage of utero-gestation, a zone of villi encircling the young ovum, tallying in situation and comparative width with the placenta, which is afterwards to be elaborated. (See Sharpey, in Müller's Physiology, p. 1576.)

Plate 24, from Hunter's splendid work on the gravid uterus, displays an ovum of five months age within the womb, which has been laid open: the vessels ramifying on the decidua ovuli are well delineated; and the gelatine secreted by the glandulæ Nabothi at the cervix uteri *a* is also tolerably distinctly pictured. One coil of the funis is seen twisted round the neck, and another round the left ancle.

Amnion.—The chorion having been cut through, we next meet with the amnion, another very thin, transparent, and tough membrane, in structure and appearance so similar to the chorion, that it is impossible to distinguish the one from the other, except by its being the stronger of the two. It is destitute of coloured vessels, but it too must possess vascularity; because, like its twin sister, it becomes thickened by disease, and because it enjoys in an eminent degree the power of secretion. It runs in contact with the chorion throughout its whole extent, except just at the placental extremity of the funis umbilicalis, where these membranes are separated; and to this formation the term processus infundibuliformis has been applied. It is connected with the chorion by means of an intermediate transparent substance, which has the appearance of an extremely delicate arachnoidal membrane. This has been called the *tunica media.** The amnion gives an external coat to the fœtal face of the placenta, and to the funis umbilicalis. On dividing the navel string, we find the chorion between the amnion and the proper substance of the funis itself. The placenta and funis, then, may be said to be behind the amnion and chorion, in the same way as the bowels are said to be behind the peritoneum. Its use is exactly analogous to that of the chorion, so far as affording a covering to the ovum is concerned; but it performs an additional distinct function in the secretion of the liquor amnii.

It is worthy of remark, that these conjoint membranes do not always possess the same degree of toughness; for we sometimes observe them in labour so exceedingly tender, that they break on the very first accession of pain; while at others, their firmness is so considerable that they remain entire much longer than they ought, and thus proportionably retard the delivery. In some few instances they have not been ruptured at all before the child's birth; but the ovum has been expelled whole, even when it has arrived within a few weeks of its maturity. Nor do they increase

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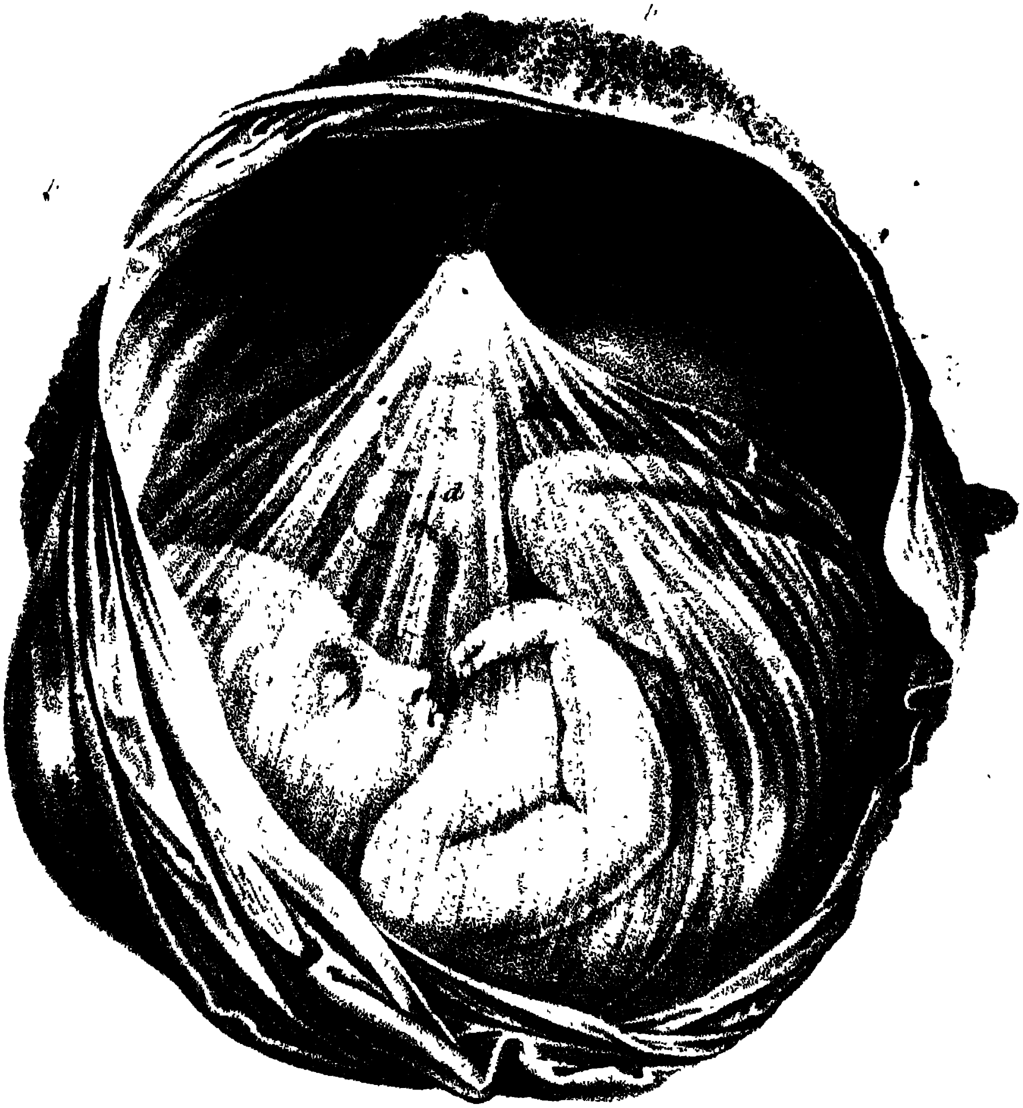
* Wagner's Physiology of Development, by Willis, p. 193. Müller (Physiol. by Baly, p. 1571), says the membrana media is the same as the "endochorion" of Dutrochet, and is very vascular; though at p. 1582, he gives a separate identity to the endochorion, as a thin layer of membrane loosely adhering to the inner surface of the chorion; as does also Wagner, who designates it as a "vascular lamina."


b
b
c
a

in density and strength in a relative proportion as the process of gestation advances: for even at the earliest age, they resist the application of moderate pressure; and at five or six months, they are often found as strong as they usually are at the expiration of the whole period: of the two membranes the amnion is by far the strongest.

In the young ovum the chorion is separated to a considerable extent from the amnion, which at this period closely embraces the embryo. The space is filled by a transparent, albuminous fluid,* of a consistence not unlike the vitreous humour of the eye, in which the umbilical vesicle lies imbedded;†—the *corps reticulé* of Velpeau. A net-work of very fine filamentous processes passes between the amnion and chorion, connecting these membranes together, and intersecting the intervening fluid at all points. This fluid is gradually absorbed during the progress of pregnancy; and in its stead the tunica media is left. Sometimes, though rarely, some fluid is found between the amnion and chorion at an advanced period of gestation; and this is what in labour is called the *false waters*.

In plate 28, fig. 2, is delineated an ovum of about five weeks age, in which the outer sac, *a* the chorion, has been opened to display *b* the amnion enclosing the embryo, and *c* the vesicula umbilicalis. In this specimen, the chorion is of far greater extent than the amnion, and there existed a proportionate quantity of fluid between them. These two membranes are also beautifully shown in plate 25, representing an ovum of five months age. The fœtus is enclosed within the amnion, which is unopened, and is separated both from the chorion and placenta, but still adherent to the placental extremity of the funis: *a* a portion of deciduous membrane, *b* the placenta, *c* the chorion, *d* the amnion with the fœtus within it.

LIQUOR AMNII.—The two layers of the decidua, as well as the chorion and amnion, being opened, we penetrate into the centre of the ovum, and the liquor amnii escapes. This is the name given to the waters surrounding the fœtus, and in which the embryo, at the early stage of gestation, may be said to float. The liquor amnii varies exceedingly at the end of gestation, both in its quantity and properties:—in quantity from a few ounces to a gallon or more; in properties, from being perfectly pellucid and inodorous, to a thick, somewhat viscid, dirty fluid, nearly as dark as a common infusion of coffee, and occasionally, though rarely, of a putrid odour. The usual appearance of the liquor amnii is that of rather dingy water, of a greenish or yellowish cast.* It contains chloride of sodium, some salts, especially the phosphate of lime, and a free acid known as *amnic acid*, by some supposed to be benzoic acid. Urea has also been discovered in it by Davy and Rees;† and sometimes a very small quantity of albumen is held in solution, as is evidenced by its becoming rather turbid on the application of heat.

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* Wagner (Op. Cit. p. 193,) calls this fluid gelatinous. Blumenbach, § 567, says the space between the membranes "is filled by a clear water which may be called the *liquor chorii;*" and Müller (Phys. by Baly, p. 1582) that it is "sometimes of a fluid consistence, at others *gelatinous*," and in the same page he speaks of it as an "albuminous secretion."

† See plates ii., ii^{a}., iii., and iii^{a}. in Costé's Atlas, illustrative of his "Histoire du Développement des Corps Organisés." Also two magnified ova in Wagner's Physiology, already quoted, pages 164 and 167. In all these drawings the umbilical vesicle is clearly occupying a portion of the "albuminous space."

The relative proportions between the quantity of the fluid and the size of the embryo differ much at different stages of pregnancy, being considerably greater in the early periods, and less at the advanced stage. Thus, when the embryo is scarcely visible to the naked eye, there is from half a drachm to a drachm of water collected within the membranes. In plate 22, fig. 3, where the embryo is not so large as a small kidney-bean, there would be an ounce or more of liquor amnii; while at the end of gestation, when the fœtus weighs on an average nearly seven pounds, the amount of fluid seldom exceeds a pint. The quantity, therefore, though *positively* increasing with the growth of the ovum throughout the whole of gestation, is, *relatively to the size of the fœtus*, gradually diminishing.

The origin of this water has given rise to much controversy:‡ it has been regarded as an excretion from the fœtal body,—either urine or perspiration. This, however, cannot be, because, as just observed, a quantity of fluid is present before the embryo is visible; and the relative proportion to the size of the fœtus at the different ages of pregnancy would also discountenance such an idea. It has been regarded as a specific uterine secretion; but in extra-uterine conception it is found surrounding the fœtus, and not within the uterine cavity. It is now generally believed to be a secretion or exudation from the inner surface of the amnion.

Use.—Nor has its intention or use been a less fruitful ground of dispute. At one time it was supposed to be formed for the purpose of nourishing the fœtus;§ but this notion is very unphilosophical;—because we can assign other most valuable uses to it;—because we have no need of its agency in this respect, since there is a regular system of vessels connected with the fœtus, through which the means of increase can be supplied;—because it is sometimes perfectly unfitted for nutriment, being foul, turbid, and of a greenish colour, probably from the admixture of meconium with it;—because it is proved by analysis to contain no nutritious properties, or if any, a very inconsiderable proportion;* —and because of the large relative quantity in the first few weeks of gestation. Besides, monstrosities have been brought forth without either œsophagus or digestive apparatus. Such a production could not have obtained nourishment by means of internal organs. These facts have led Lobstein and others to believe that it nourished the fœtus by absorption through the skin. This supposition is equally improbable, for many of the reasons just stated; and to them it may be added, that if the liquor amnii is secreted by the amnion, which is continuous with, and, as it were, an extension of, the fœtal skin, we cannot concede to it the office of affording a nutritious matter to be afterwards absorbed by the cuticular vessels.

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* The dingy, greenish colour is probably dependent on some meconium having passed from the rectum of the fœtus before its birth.

† Lee's Lecture, Med. Gaz. January 13th, 1843, p. 530.

‡ "Its source is doubtful." (Blumenbach, § 568.) "Its source is still unknown." (Rigby; Library of Med. vol. vi. p. 30.) I cannot imagine the possibility of its being derived from any other source than the membrane which incloses it.

§ Heister, Haller, Darwin. Müller (Physiol. by Baly, p. 1609) says the liq. amnii passes into the stomach; for in the fœtus of the human being, as well as other animals, hairs have been found in the stomach. But he acknowledges "that

Its real use appears to be, to defend the young embryo in the early weeks of pregnancy, from the pressure of the uterine parietes, which must otherwise have annihilated it; and this is the reason why it then exists in such large proportionate quantity;—to protect the vessels of the funis and placenta in the latter months from a degree of compression which would have impeded the regular flow of blood through them;—and to allow free motion to the limbs of the fœtus, so as to prevent their being cramped or distorted. It has also been supposed (since water is so bad a conductor of heat) to keep up an equable warmth in the fœtal body throughout the whole of gestation, to whatever varying circumstances of temperature the woman's body may be exposed. Besides these advantages, we find it performing a most important service in labour, when it conduces so essentially to the formation of the soft wedge-like bag. Its value does not cease even on the rupture of the membranes; for it assists in lubricating the vagina and external parts, and by this means prepares them for the more easy passage of the child.

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this mode of nutrition must be of trifling and very inadequate amount." Rigby (Lib. of Med., vol. vi. p. 30) thinks "it is a means of nourishment to the fœtus during the first part of pregnancy, from the fact that it contains more nutritious matter in the early than in the latter months;" and that "the disappearance of the coagulable matter which it contains, towards the close of pregnancy, may be attributed to its having been absorbed at an earlier period, and to the process of nutrition being now carried on by other means." To this opinion I cannot give my assent.

[*] "Occasionally, the quantity of coagulable matter in the liquor amnii is nearly as great as in the water of ascites." (Wm. Hunter, Grav. Uterus, p. 61.)

Placenta.—Of the fœtal appendages—all of them highly essential towards the well-being of the ovum, either at the early or more advanced period of intra-uterine life—the placenta is perhaps the most important;—the medium of communication between the mother and her infant;—the organ through whose means life is sustained, nourishment supplied, and growth perfected.

The term placenta was derived from its shape.[*] It consists of a flat, spongy, irregularly circular mass, composed almost entirely of fœtal vessels,—the ramifications of the umbilical arteries and vein, which are connected together by loose cellular substance. At the full period of pregnancy it is usually from seven to nine inches in diameter, and about one inch in thickness at the thickest part, where the umbilical vessels enter its substance, gradually becoming thinner towards its edge. It generally weighs about a pound or a little more; but in this respect it varies considerably, its bulk being principally influenced by the size of the child; sometimes, however, its increased weight is dependent on an excess of its own growth alone, probably the effect of diseased action. It has been supposed to possess absorbents. Hunter[†] suggested the probability of these vessels being present; Schræger,[‡] Wrisberg,[§] and Chaussier,[||] contend for them; and Fohman[¶] imagined he had found them in rich profusion. Sir E. Home and Mr. Bauer[**] believed they had detected nerves by the aid of a strong magnifying power; and this is also the opinion of Chaussier. I have never been able to see either nerves or absorbents in this organ, or in the funis; and most physiologists deny their existence. If it possessed absorbents, we might presume they would be readily found; and a strong argument against there being nerves, is the fact, that no pain is felt by the child when the funis is divided.

It has two faces:—the one fœtal (plate 26, fig. 1), next the embryo; the other maternal (fig. 2), in apposition to the uterus. According to Hunter and Baillie, it is covered on the fœtal face by the decidua chorii,[††] as well as by the chorion and the amnion; and on the maternal by the decidua vera. The fœtal surface has therefore a smooth, glistening appearance, which it obtains from the two ovular membranes; these are raised into numerous dark-

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[*] *Placenta* in the Latin language signifies a cake; from πλάκους, the same. It is also called the *afterbirth*; and, with the membranes and the cord, the *secundines*.

[†] MS. Lectures; *vide* Granville on Abortion, p. 19.

[‡] De Fonct. du Plac. 1799; Archiv. de Schweighaeuser, sur l'Art des Accouchemens, tom. i. p. 179.

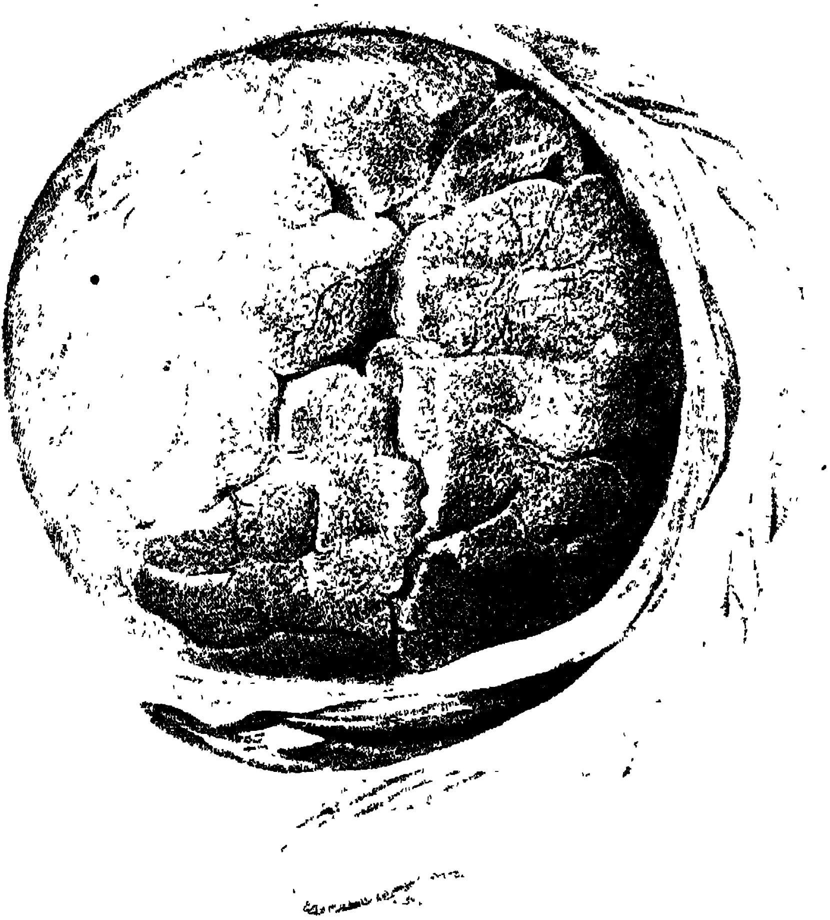
[§] Archiv. de Schweighaeuser, tom. i. p. 163.

[||] Journ. Univers. tom. i. p. 233.

[¶] De Vaiss. Absorb. du Placenta et du Cordon, Liège, 1832.

[**] Philos. Trans. 1815.

[††] Gravid Uterus, p. 54.



coloured ridges, radiating in a serpentine manner from near the centre, and becoming less evident as they approach the edge; produced by the divisions of the umbilical vessels, before they dip into, and bury themselves in the substance of the mass. As these tortuous eminences are vessels, and the largest of them veins, the deepness of their colour depends on the contained blood shining through their coats, and the transparent membranes covering them. The umbilical arteries, after dividing upon the fœtal surface of the placenta, enter the substance of that organ at irregular intervals; and splitting into innumerable ramifications, are carried forward obliquely, towards the maternal face. They there terminate in beautifully coiled and convoluted capillaries, which form tufts or bouquets, and are continued, as loops, into the minute origins of the umbilical vein. In their course they carry with them, as an investing membrane, a very fine process of the chorion, which surrounds and encloses them in a kind of bag, depicted in the cut at page 73. The veins, whose capillary extremities are enclosed in the same sheath, gradually approximate each other, and form, by coalescing, larger and larger trunks, until they all unite in the one capacious canal,—the vein of the funis umbilicalis. The arteries and veins continue to preserve the same comparative size and arrangement during their whole course in the placenta, which obtains between them in their transit along the navel string,—that is to say, in all their ramifications, even to the minutest subdivisions, two arteries accompany one vein,* a circumstance which, as far as I know, has not before been made the subject of remark; the arteries are much more convoluted than the vein by the side of which they run;—and the calibre of the vein appears much greater than that of both the attendant arteries together. The branches of the vein, then, although much larger than the sub-divisions of the arteries, are considerably less numerous.

The maternal surface presents a very different appearance from the fœtal; invested with the opaque, flocculent, fibrous decidua, it puts on a fleshy look, and is divided by sulci into a number of irregularly shaped lobes. Each of these lobes is formed by the ramifications of one branch of the umbilical arteries and vein on their first splitting; and the vessels of one lobe, subdividing in an arborescent form, anastomose but sparingly with each other, and not at all with those of its neighbour.†

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* See the second cut at page 74.

† I have stated, on the high authority of Hunter and Baillie, that the decidua chorii passes between the chorion and the fœtal face of the placenta, the two layers of the membrane splitting to receive that organ between them. I must confess that I have never been able to detect anything like the decidua between the chorion and the bed of the placenta; and I cannot help thinking Breschet's opinion more correct,—namely, that both layers are placed between the placenta and the uterus. It

Use.—It is now established as an incontrovertible fact, that the salubrious change which the fœtal blood undergoes, is accomplished in the placental mass; but the immediate mode has given rise to much difference of opinion. It has been explained in four ways. Some physiologists contend that there is a direct communication between the mother and the fœtus by means of *continuous vessels*.[*] Others, that the mother's blood passes by *absorption* into the fœtal system.[†] Others, again, that the mother's blood is poured into certain *sinuosities* or *cells*, existing on the maternal surface of the placenta, which are destined by nature to receive it; and that while extravasated in these cells, the fœtal vessels deprive it of whatever is necessary for the preservation of the embryo:[‡]—while another party entirely denies the existence of

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appears to me that the decidua vera is carried over the maternal surface of the placenta, from lobe to lobe, like the arachnoid over the convolutions of the brain, while the decidua chorii not only invests the uterine face of the organ, but sends off processes which dip deeply among the placental villi, and knit them together. The villous radicles of the chorion in the young ovum, penetrate and take root in the deciduous membrane, as already noted; and at the same time the decidua, by a series of nucleated cells—or, in other words, by a process of ordinary growth—sends filaments upwards by the side of the villi, closely embracing these prolongations all around, by means of which the villi become cemented together; and a solid mass is formed of what previously consisted of a series of unconnected shaggy tassels; so that what I have above called the *cellular substance* connecting the vessels together consists, in truth, of processes of decidua reflexa. J. Goodsir (Anat. and Pathol. Observations, p. 60) seems to entertain very much of the same idea; for, speaking of the villi of the chorion in the young ovum attaching themselves to the uterus through the intervention of the deciduous membrane, he says, "the vessels of the decidua enlarge, and assume the appearance of sinuses, in the midst of which the villi of the chorion are embedded. This increase in the calibre of the decidual capillaries goes on to such an extent, that finally the villi are completely bound up or covered by the membrane, which constitutes the walls of the vessels, this membrane following the contour of the villi, and even passing to a certain extent over the branches and stems of the tufts."

[*] This—the oldest notion of the mode of communication—has been of late years revived by Dr. Radford, of Manchester, in a pamphlet on the structure of the human placenta, published in 1832: though at page 19 he says:—"The vessels are extremely minute, and (it may be) only convey the more subtle parts of the blood." Flourens also (Cours sur la Génération, 1836, p. 130) contends for there being a direct communication in the human subject; but he states that this communication exists only in those animals which have a *single* placenta, as in man, the carnivora, and the rodentia.

[†] Rouhault was the first to deny that any continuity of vessels existed between the uterus and placenta, and to promulgate the doctrine of the transmission of the fœtal blood into the mother's system by absorption, and *vice versâ*. (Mémoires de l'Académie Roy. des Sciences, 1717, p. 11.) About twenty years afterwards, Dr. Simpson, of St. Andrews, published the same opinion, which was held by Haller, Roederer, Donald, and Alexander Monro.

[‡] This theory, established by the illustrious Hunters, has been accepted almost universally in the schools as the correct description, even to the present day. In the year 1780, indeed, Mr. John Hunter presented a paper to the Royal Society, in which he claimed the merit of having discovered the true structure of the placenta, and its connexion with the uterine circulation. He describes those uterine arteries which are not employed in nourishing the organ, as making two or three close spiral turns upon themselves, then passing obliquely through the decidua into the substance of the placenta, without any diminution of calibre, and there terminating by open extre-

any placental cells into which the mother's blood is extravasated; and supposes that the same benefits result to the fœtus—its vessels ramifying in close approximation to those of the mother—although the mother's blood *never enters the substance of the placenta* at all, nor ever, indeed, leaves her system.*

mities in cells on the maternal surface of that mass. From these cells arise veins by large patulous mouths, *which are more than equal to the size of the veins themselves,* and entering obliquely the substance of the uterus, immediately communicate with the veins proper to the uterus, and return the blood to the mother's system. (See also his Animal Economy, Palmer's Ed. p. 67.)

Entirely corroborative of these views is the description given by Dr. Hunter (Gravid Uterus, p. 48):

"For it seems incontestable," he says, "that the human placenta, like that of the quadruped, is composed of two distinct parts, though blended together; namely, an umbilical, which may be considered a part of the fœtus, and a uterine, which belongs to the mother; that each of these parts has its peculiar system of arteries and veins; that the circulation through these two parts of the placenta differs in the following manner:—in the umbilical portion, the arteries terminate in the veins *by a continuity of canal;* whereas in the uterine portion there are *intermediate cells,* into which the arteries terminate, and from which the veins begin." And again he writes: "In separating the placenta from the uterus, *which is commonly practicable with the least imaginable force, all the vessels are torn through;* and then *each broken vessel* has an open mouth upon the inner surface of the uterus, and a corresponding orifice on the outer surface of the placenta." "Though the texture of these vessels be so exceedingly tender *that they break with the least force*" (page 45). Also in page 42. "They *all break through* in separating the placenta from the uterus, leaving corresponding orifices on the two parted surfaces."

Both Dr. Hunter and his brother, therefore, considered the placenta divisible into two distinct portions—a fœtal and maternal; and they described also two separate circulations going on in it simultaneously,—the one of the mother, the other of the child.

* Seiler (Die Gebärmutter und das Ei des Menschen, S. 31, Dresden, 1832); Velpeau (Embryologie Humaine, p. 65); Meigs (Treatise on Obstetrics, p. 209); Mr. Adams, of Banchory (Med. Gaz. vol. i. 1845, p. 755), with others, may be cited as holding this opinion.

I have purposely abstained from describing the evolution of the ovum, because to enter into that deeply interesting subject would swell this work—already I fear too bulky—to an inconvenient size. But as the mode of connexion between the fœtus and its parent, through the medium of the placenta, explains the violent hæmorrhages which occasionally take place in labour, and possesses, therefore, a high degree of practical importance, I have thought it worth while to bring under the notice of the student what it has occurred to me to witness in the course of my post-mortem examinations. Opportunities, indeed, of inspecting the bodies of women who have died undelivered during labour, or within a short time of the close of gestation, are very rare; and only four such instances have occurred to myself. Two of these uteri, after removal from the body with the placentæ attached, were taken home by me, and made the subject of very careful investigation for the purpose under review; and on both these occasions the same phenomena presented themselves.

On separating the placenta from the uterus very cautiously, the greatest part of the deciduous membrane was detached from the uterine surface, and remained adherent to that of the placenta. At the same time, innumerable small, excessively tender, filamentous bands of communication between the two surfaces, were observed to break, and that *with the least possible effort,* by the mere raising of the placenta. They might be likened, in appearance, to the threads of gelatinous fluid that are seen on slowly lifting a flat-fish—a sole, for example—by one end from a plain surface. Some of these appeared to be the fibrous bands of the easily lacerable decidua; while others, that were drawn out to a greater extent, were, there is no doubt, the minute curling arteries of Hunter; and others again might be the prolonged fœtal tufts

But rendering the blood fitted for the continuance of life is not the sole office of the placenta; it is the means also of conveying

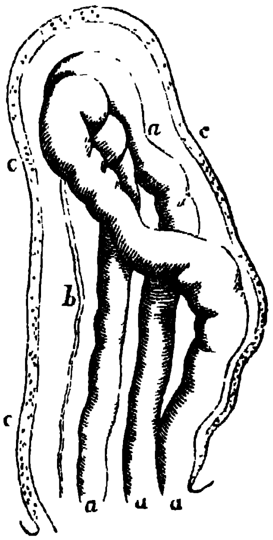
which Dr. John Reid describes, as passing into the uterine sinuses. The separation displayed apertures in large vessels upon the surface of the uterus, mostly of an oval shape—some of them capacious enough to admit the tip of the little finger, *with edges perfectly smooth, bearing no appearance of laceration*,—which had been quite closed by the apposition of the placental mass. On passing a blunt probe into most of these apertures, it ran for some little distance horizontally, just underneath the mucous membrane, and came out at another aperture of a similar character as the former. The same thing occurred also when the probe was introduced into the first tried opening, and insinuated in the opposite direction. Very many of the same kind of apertures, on admitting the probe, allowed it in a similar manner to escape through an opening in the same canal; but some of these vessels were too tortuous to permit the instrument being carried beyond a small fraction of an inch; while others again were straighter, and three or four successive holes were remarked *in their sides;* the probe at these places appearing naked and uncovered. These vessels, from their large size, the thinness of their tunics, and other anatomical characters, were doubtless dilated veins, or, as they are called, the *uterine sinuses;* and the apertures were so many and so large that the surface of the uterus occupied by them appeared considerably greater than that where the membrane was entire. Nor was this kind of arrangement confined to the superficial portion of the uterus; but below the vessels mentioned there were others of the same description communicating with those above them by numerous and wide openings—and more still, the deeper the dissection was carried; so that there seemed to be a number of successive layers or tiers of these capacious canals, lying one over the other, and all freely anastomosing together: the consequence of which would be, that in life a very considerable quantity of blood would be contained within this intricate vascular uterine network, in close proximity to the placental surface.

Since all these apertures appeared to be in *venous trunks*, it would seem evident that those uterine arteries that are destined for the service of the fœtus, do not terminate in open mouths on the surface of the placenta; but in veins, as in other parts of the body; that the veins soon become dilated into wide canals, and that the blood, passing from a narrow channel into one of greater capacity, is detained in the larger vessel, as must necessarily happen on the common principles of hydraulics, —giving ample time and opportunity for the fœtal blood to undergo that salubrious change requisite for the continuance of fœtal life. These apertures are placed exactly opposite to the shallow sinuosities or cells on the maternal face of the placenta described by Hunter; and while that mass is in contact with the uterine surface, the uterine veins are plugged by its apposition; so that the membrane which lines the placental cell, by forming, as it were, one side of the vein, at that part where the orifice exists, perfects the integrity of the vessel as a continuous canal. A sort of pouch is thus produced, made up of the placental cell on one side, and the dilated vein on the other, which answers the double purpose of arresting the circulation through the uterus for a longer period, and at the same time permitting a greater number of the capillary vessels of the placenta to come into contact with the maternal blood. (The substance of the foregoing remarks was published in my lecture, in the Medical Gazette for January 25th, 1834, p. 615.)

There are two circumstances which particularly militate against the idea that the arteries terminate in, and that the veins commence by, open mouths upon the placental surface. The first is, that such a communication would entail the necessity of the vessels being "torn through," as Dr. Hunter expresses it; whereas the openings on the face of the uterus are all perfectly smooth, their edges not showing the least indication of laceration, neither can any trace of such "broken vessels" be detected on the placenta. The second is the observation made by Mr. J. Hunter (Animal Economy, Palmer's Edit. p. 67), that "the veins of the uterus appropriated to bring back the blood from the placenta, commence from this spongy substance by such wide beginnings as are more than equal to the size of the veins themselves." This is so different from what is remarked in the other parts of the animal economy, that the quotation of itself proves the veins do not originate in the placenta; for we can scarcely suppose they would commence by mouths greater than their own calibre. But the difficulty will nourishment to the fœtus; so that this viscus performs at the same time the functions of two of the most important systems of

vanish if we look upon these large openings in the uterine structure, not as the *mouths* of the veins, but as apertures in their *sides* which are larger than the area of the veins themselves; and if we consider that the uterine arteries terminate directly in the veins, instead of emptying themselves into the placental cells.

If this be the true description, the two circulations—that of the fœtus on the one hand, and of the uterus on the other—would be carried on in the following manner. The blood of the fœtus, flowing through the umbilical arteries, would permeate the whole mass of the placenta, and be circulated by means of countless ramifications over the maternal face of that organ, to be returned to the fœtal body by the umbilical vein, commencing in an equal number of minute capillary beginnings. On the other hand, the maternal blood, determined to the neighbourhood of the placenta by the tortuous uterine arteries, would pass immediately from them into the uterine veins; and these, dilating considerably at their very commencement, would transmit their contents onwards in a slow, sluggish, and torpid stream. During this partial stagnation it would impart to the fœtal blood the elements of vitality and nourishment by means of the innumerable apertures that exist in the *sides* of the uterine sinuses. These apertures being plugged by the placenta, the delicate placental capillaries would be brought into close contact with, and bathed, as it were, in [illegible] maternal blood, there being nothing but their own epithelial covering, and the tender deciduous membrane interposed between them and the vital fluid of the mother; and as in the lungs of the adult, the changes in the blood take place, notwithstanding that the lining membrane of the air-cells and the coats of the vessels themselves intervene between the fluid contained in the vessels, and the air contained in [illegible] pulmonary cells,—or rather as the blood in the branchial vessels of aquatic animals is acted on through the branchial membrane by the atmospheric air pervading the water in which they swim,—so the same kind of alteration occurs in the fœtal blood brought into close approximation to the pure blood of the mother, through the spongy and cellular coats of the placental vessels, the thin and porous sheath in which they lie, and the fine layer of deciduous membrane, carried over the maternal face of the whole placental mass. The extreme tenuity of these coverings allows a free interchange between the fœtal and maternal systems, of whatever is required for the well-being of the child.



The accompanying diagram from Weber will explain the mode of termination of the umbilical arteries. It is a view of the extremity of a villus of the chorion, taken from a mature placenta, magnified by two hundred and ninety diameters. "The ends of the villi are formed by the inosculating loops of the minute arteries and veins of the fœtus" ramifying on the maternal face of the placenta. The vessels *a a a* are full of blood; *b* is an empty one; *c c* pellucid margin of the villus. (See Wagner's Physiology of Development, by Willis, p. 200; also Baly's Transl. of Muller, p. 1605.)

I can testify, from my own observation, to the correctness of the appearance delineated; and subjoin a cut, taken from a sketch kindly made for me by Mr. John Birkett, by the aid of the camera lucida. It represents a simple loop at the termination of one of the fringes of the placental tufts, magnified two hundred and seventy times, and so strongly resembles Weber's illustration as to leave no doubt of the truthfulness of that drawing. The pellucid margin carried around the extremity of the loop may be observed to contain nucleated cells. According to Dalrymple, it is a prolongation of the chorion, originally extended along the whole length of the villus, and encircling it as a purse, which persists even after the vessels have become bound together into a solid mass by the formation of the placenta.

At page 204 of Willis's Wagner, and also in that just referred to of Müller, there breathing life,—the lungs and the gastro-enteritic canal; nor is it difficult to suppose that the double function may be performed at

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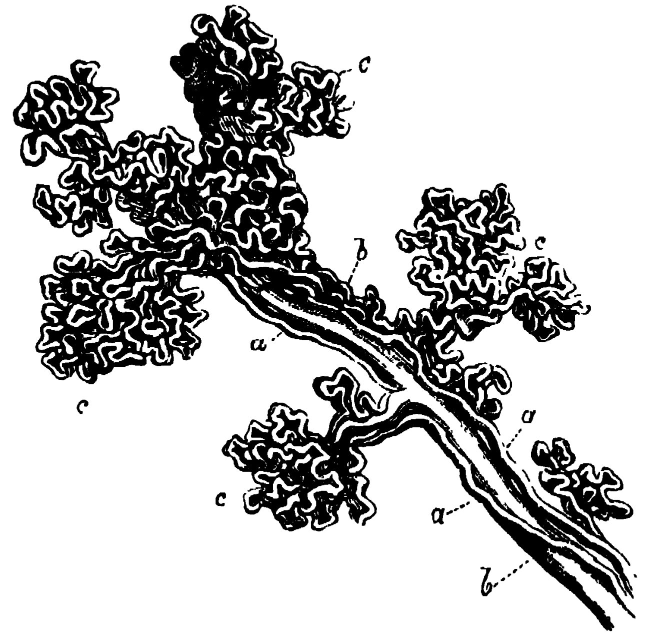
will be found the representation of a large bunch of villi from a mature injected placenta, after a drawing communicated by Weber. This delineation also strikingly accords with the appearance presented by many different portions of a very finely injected placenta submitted by myself to the microscope. Below, I give a sketch of one of these portions, made by Mr. Leonard, of the College of Surgeons. It is magnified to about fifty diameters. *a a*, the umbilical arteries, which in this instance run much straighter by the side of the vein than they are wont to do. *b b*, the umbilical vein. *c c*, coiled and convoluted capillaries, the termination of the minute placental blood-vessels, forming a series of vascular loops, collected together in very intricate fasciculi.



Of late years, many observers have doubted the correctness of the Hunters' views, and explained the connection between the mother and her offspring in a manner totally different from the theory inculcated by those celebrated philosophers; notwithstanding that Prof. Owen (see J. Hunter's Works, Palmer's edition, vol. iv. p. 67) adds his high authority in favour of their correctness; and in spite of the report made by Messrs. Stanley and Mayo on the preparations of impregnated uteri preserved in the Museum of the College of Surgeons, which is entirely in favour of them also. (See Lancet, June 22nd, 1833.)

Weber, who has investigated the structure of the placenta with much care (Hildebrandt's Anatom. des Menschen, iv. Band, S. 495), adopting to a certain extent the Hunterian doctrines, thinks that the arteries and veins of the uterus penetrate in great numbers into the placenta. (See Willis's Wagner, on Develop. p. 201, note.) Wagner subscribes to Weber's views, as does also Eschricht (De Organ. quæ Respir. Fœtus Mammal. Inserviunt; Prolusio Acad. Hafniæ, 1837). Baer (Entw. S. 279) says, "It was long believed with Hunter that the placental vessels passed into cavities: in more recent times there appears a growing disposition to regard these spaces as *enlarged veins with extremely thin walls.*"

Dr. J. Reid (Edinb. Med. and Surg. Journ. vol. lv., p. 4) describes and delineates the vascular fœtal tufts on the maternal surface of the placenta *as dipping into the uterine sinuses;* and thinks that the "inner coat of the vascular system of the mother is prolonged over each individual tuft, so that when the blood of the mother flows into the placenta it passes into a large sac formed by the inner coat of the vascular system of the mother." "From this sac the maternal blood is returned by the utero-placental veins, without having been extravasated, and indeed *without having left her own system of vessels*" (p. 7). It is impossible to understand how this arrangement could be perfected, if the arteries terminated, and the veins commenced, by open mouths; but the explanation would be easy, provided the openings were at the *side* of the vessels, and all those vessels formed a part of the venous system of the uterus.

In the xxvth volume of the Transactions of the Medico-Chirurgical Society, 1842, one and the same time by the vascular apparatus of this beautifully constructed organ.*

there is a paper on the structure of the human placenta by the late Mr. Dalrymple, which displays much careful observation. He there says positively that "there are no distinct or defined cells constituting a maternal portion of the placenta;" that its whole mass is made up of the fœtal vessels; and that the decidua, so far from pervading the substance of the placenta as deep as the chorion or inner surface, as described by Hunter, "does not appear to enter further than between the lobules; and the depth to which it thus penetrates varies with the extent of the fissures." Differing, therefore, in these material points from the Hunters, he must repudiate the whole of the theory built up on the groundwork of their dissections. And his, as well as Dr. J. Reid's observations, tend to bear out my own. Dalrymple has published two drawings illustrative of his essay,—one a double loop of a placental villus, the other an aggregation or collection of villi: both which bear a strong resemblance to Weber's and my own. In one of Dalrymple's, the nucleated cells of the chorion enclosing the villus are depicted more distinctly even than in that made for me by Mr. Birkett.

The foregoing appeared in the last edition of this work; but I have thought it right to follow up this subject somewhat more at length now than I did then, chiefly in consequence of what I cannot but designate a very unfair criticism, published in the British and Foreign Medico-Chirurgical Review for April, 1852. I am there told that I ground my assertions on a very coarse mode of dissection; and I am called to account for stating that some of the small bands, which broke when the surface of the placenta is carefully raised from its attachment to the uterus, *appeared* to be fibres of the tender decidua, while others were *no doubt* minute arteries. I am then lectured, and informed that some of these are *tubes*, forming a communication between the uterine arteries and the interior of the placenta; as if indeed a blood-vessel could be anything but a tube: and the only cause for the tirade against me seems to be that I did not speak positively or *dogmatically* enough for the *refined* taste of my *modest* castigator. The reviewer goes on to say, that it is impossible I can have had adequate opportunities of forming a judgment; and that when I shall have occupied *weeks* in the dissection of a single attached placenta under water, as Dr. Reid did, or watched its development with the same care and attention as that bestowed on it by

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* Every physiologist of the present day acknowledges that the placenta is subservient as well to the nourishment and growth of the fœtus, as to the preservation of its vitality by the oxygenisation of its blood; and Prof. Goodsir (Anatom. and Pathol. Observ. p. 62) has offered the following explanation of the manner in which the nutriment is supplied. Agreeing with Dr. Reid that the placental villus is covered by a membrane which is "a portion of the wall of the vascular system of the mother, continuous with the rest of that wall," and which he calls the external membrane of the villus, he describes within that another very similar in appearance to the first—"the internal membrane of the villus, or the external membrane of the chorion." He delineates in each membrane a number of cells, exactly like those pictured in the above drawing, made for me by Mr. Birkett, only much more numerous. He says that there is a cavity between these two membranes filled with a nutritive fluid; that this fluid is secreted by the cells of the external membrane, which is a part of the system of the mother, and absorbed by the cells of the internal membrane, which is a part of the economy of the fœtus, for the growth of the embryo. He regards the external membrane in the same light as the glandular cotyledon in the gravid uterus of the ruminant; the space between the two membranes as the cavity of a secreting follicle, and the matter thrown into this space as the milky secretion in the cotyledon's cup. He thinks the "maternal portion of the placenta" consists not only of a part of the vascular system of the mother, but that it includes also the whole of the external cells that surround the villi (p. 69). This is certainly an ingenious hypothesis, and one which may be admitted and received, until it is superseded by some other deduced from equally laborious research, and bearing in a greater degree the stamp of probability.

Attachment.—The placenta may be attached to any part of the internal surface of the uterus, and it necessarily occupies a space equal to its own diameter. It is perhaps most usually apposed

Prof. Goodsir, some weight may attach to my opinion. I am far indeed from desiring to undervalue the labours of either of these accomplished physiologists, who have both added so much to our information on this obscure subject; but I take leave to tell this captious critic, that both have I enjoyed the opportunities, and have endeavoured to turn them to the best advantage that I could; and, challenged in this way, I cannot avoid vindicating myself, even at the risk of being considered tedious. On the former occasion, fearing to be too diffuse, I probably did not convey my meaning intelligibly enough. This is an error others besides myself have committed:—

> "Brevis esse laboro,
> Obscurus fio."

If the practice, at last creeping slowly into use, ever becomes general, of reviewers appending their names to their criticisms, we shall know exactly what weight to attach to *their ex cathedrâ* denunciations; and the shaft will strike with the greater or the lesser force, in proportion as it is hurled by the hand of a giant or a pigmy. Besides which, it will be at once obvious whether it were possible that any lurking feeling of rivalry might or might not have interfered to prompt the expression of an unfavourable judgment.

While on this subject, I may perhaps be permitted to offer my heartfelt thanks to those gentlemen who have publicly noticed my attempts to divest the study of obstetric science of some of the difficulties that surrounded it, and to render it more simple and easy. With the exception of that one critic, every reviewer has spoken of my work in a manner calculated to call forth my deep and most grateful acknowledgments.

I have stated above that opportunities have been afforded me of opening the bodies of four pregnant women; and the two uteri, from the dissections of which the conclusions I have deduced were chiefly derived, had both reached the full period of gestation. They were, therefore, better calculated to display the peculiarities of structure than Dr. Reid's single one, which was in the sixth month. I carried them both away with me, their placentæ being still attached; and, assisted each time by one of the best anatomists of the day, I made them the subjects of very minute inspection, in the manner that I thought most favourable for elucidating the truth. On both these occasions, exactly the same phenomena were observed; and I have surely a right to claim the privilege of describing what I saw in my own way.

So far from Dr. Reid and myself differing essentially, we are perfectly agreed in almost all the material points. Dr. Reid describes the fœtal tufts in the placenta much as I do; so also do Dalrymple and Goodsir. Dr. Reid affirms that the placental villi are prolonged into the uterine sinuses; and that thus the minute extremities of the placental vessels are *bathed* in the maternal blood. I state that the delicate placental capillaries are brought into close contact with the maternal blood, and are, as it were, *bathed* in it. Dr. Reid says, "the inner coat of the venous system of the mother," or, in other words, the inner membrane of the uterine sinuses, is reflected over the tufts of the placenta, binding these tufts down at various points. I have said the membrane which lines the placental cell (and which, therefore, as a matter of course, must *cover* the fœtal tufts) forms one side of the vein, while the placenta remains in apposition, and thus renders the continuity and integrity of the vein perfect; but I have not stated it to be a *reflexion* of the coat of the uterine sinus. Even Dr. Reid, in another part of his paper, does not consider this point quite cleared up; for he afterwards speaks of the terminations of the placental vessels being "closely ensheathed in prolongations of the inner coat of the vascular system of the mother, *or at least in a membrane continuous with it.*" Dr. Reid's opinion, that this is a *reflexion*, or, as it might with more propriety be named, a *continuation* of the inner membrane of the uterine sinus, may very likely be correct; at any rate, there is the membrane which I spoke of long ago lining the placental cell; and its edges are perfectly smooth, and bear no appearance of laceration. Dr. Reid "satisfied against the posterior surface of the body; but occasionally it is found at the very fundus, more rarely towards the neck, and more seldom still over the mouth itself; in which latter case its position must necessarily give rise to much loss of blood when the orifice opens in labour.

himself, but not without considerable difficulty, of the existence of the utero-placental vessels described by the Hunters." "After a portion of the placenta was detached," says he, "my attention was directed towards a number of rounded bands, passing between the uterine surface of the placenta and the inner surface of the uterus." These are the filamentous bands of communication which I have mentioned, some of which are the curling arteries of Hunter.

Dr. Reid and I differ in the following particulars. He delineates one placental artery accompanying each placental vein. From the cut in p. 74, made from the drawing of Mr. Leonard, it would seem that there are *two* arteries running along with each venous branch; and it appears to me, from the numerous microscopical examinations I have made, that this is universal, and that the same arrangement—such indeed as we see in the funis itself—pervades the whole fœtal circulation through the placenta, even to the minutest subdivisions of the blood-vessels. Dr. Reid describes the large and numerous openings in the surface of the uterus, which are covered by the placenta, when that organ is *in situ*, as the *mouths* of the sinuses. I look upon them as being *apertures in the sides* of the sinuses. He also says, "When the blood of the mother flows into the placenta through the curling arteries of the uterus, it passes into a large sac formed by the inner coat of the vascular system of the mother, and is returned by the utero-placental veins without having been extravasated, or without having left her system of vessels." In this respect Dr. Reid's opinion, like my own, is at variance with that of Hunter, who contended that "the blood *detached from the common circulation of the mother* moves through the placenta, and is then returned back into the course of the circulation of the mother to pass on to the heart" (Animal Economy, Palmer's Edition, p. 67). Professor Owen again, in a note on this paper, speaks of the apposition of the fœtal capillaries with the maternal *extravasated* blood. It is now, I believe, universally admitted that whenever blood becomes extravasated, it dies. Consequently, it must follow that if the maternal blood rested in the cells of the placenta, it would become totally unfit for the purposes assigned to it. This objection then would dispose of the idea that *any extravasation* occurred into the placental cells. But if the membrane lining the placental cell is regarded as one side of a dilated vein or sinus, the integrity of the tube would continue complete while the placenta was in apposition to the uterine surface; and although, as before remarked, the circulation might be carried on slowly and languidly, there would be no extravasation of blood out of its own proper vessel.

J. Hunter described the curling arteries in one part of his essay as being the size of a crow-quill, while in another he says "they are in general half the size of a crow's quill, and sometimes larger." And Wm. Hunter describes them as "almost the size of crow-quills" (Gravid Uterus, p. 44). From the observations I made in the dissections which I conducted I should regard these vessels at considerably less than this estimate; and it is not improbable that they may have been distended much beyond their natural capacity by the artificial injection forcibly propelled into their cavities, in those subjects that were examined by the Hunters. But even were they as large as these illustrious physiologists described them, they would bear no proportion in size to the enormous capacity of the veins which they have to supply; and it seems scarcely possible that the circulation of the blood could be maintained between two systems of vessels of such different magnitude. If it be true that the *decidua reflexa*, as Wm. Hunter called the innermost of these two membranes, "produces a thousand irregular processes that pervade the substance of the placenta, as deep as the chorion or inner surface" (p. 42), which is confirmed by Dr. Baillie (cod. Op., pp. 81—84), and which I have stated above to be my own opinion also, is it not possible that the curling arteries may be merely for the purpose of nourishing these innumerable folds of the deciduous membrane, without any reference to the fœtus at all? I confess myself an advocate for this view of their function.

Its attachment is by *simple apposition*, either one or both layers of the decidua being interposed between the two surfaces. There is no *adhesion* in the natural condition of the parts; and whenever agglutination does take place, it is the consequence of diseased action.

Disease.—The placenta is liable to organic change of structure. Thus it is sometimes found so soft as scarcely to bear the gentlest handling without being broken. At other times it is much firmer than common, although no other morbid alteration can be observed in it. At others, granules or spiculæ of bone are strewn over more or less of the maternal face, or pervade more or less of the whole substance; so that when the finger is run over it, it feels as though it had been dusted with coarse sand. In other instances, again, solid tumours, bearing much the appearance of skirrhous glands, are found imbedded in the mass; and occasionally, but very rarely, it is hydatidinous. It is by no means uncommon to find a layer of coagulable lymph of various extent, thickness, and firmness, effused on the *maternal* face of the organ, generally near its edge, and sometimes on the *fœtal* face between the membranes and its bed. All these conditions, except the last, are frequently, indeed, most generally, attended by adhesion between the placental and uterine surfaces.*

Twin placentæ.—In plural gestation a separate placenta, a separate funis, a distinct set of fœtal membranes, and a distinct quantity of liquor amnii, are formed for each child. The placentæ are commonly joined together at their edges, and when regarded on the maternal face, they have the appearance of a single organ. But the vessels of the one do not anastomose with those of the other;—the circulations are perfectly independent; so that the blood of one child does not pass into the system of its brother. One of the twins may, therefore, still live after the other has died; one may be healthy while the other is the subject of disease. (Plate 28, fig. 1.)

It occasionally happens, indeed, that there exists a communication between the vascular systems of the two children, though they are both enveloped in separate membranes; and it has been also remarked, though very seldom, that both were wrapped up in the same bag of membranes, each having a funis of its own, arising from a distinct root;* and, rarer still, that the funis having arisen by a single branch from the single placenta, has split into two divisions, one to supply each fœtus.

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* See a paper on the diseases of the placenta, by Prof. Simpson of Edinburgh, in the Edinb. Med. and Surg. Journal, April, 1836, vol. xlv. p. 265. The learned professor there states that congestion and inflammation of the placenta, with their various consequences, are *certainly* its most common morbid conditions; and he cites, among others, instances of defined abscess in the organ, as well as more diffused purulent infiltration. I never myself saw an abscess in a placenta; nor indeed any distinctly marked puriform secretion, as far as my memory serves me. But these facts would tend, in my estimation, to corroborate the opinion I have given above, that the curling arteries of Hunter are designed to form and nourish the substance of the placenta, by which I mean the countless processes of *decidua reflexa*, which bind the placental vessels together, and which in the aggregate make up the chief bulk of the solid mass. It is much more reasonable to suppose that these morbid products are deposited by maternal rather than by fœtal vessels, and owe their origin to derangements of the maternal rather than of the fœtal system.

Battledore placenta.—The navel string usually enters the placenta near the middle; but it sometimes passes into it at the edge; and not unfrequently the vessels divide into a number of branches before they arrive at the substance of the mass. To this formation the name of battledore placenta is given (plate 27, fig. 1); and it is of importance, in practice, that this deviation from the natural condition should be borne in mind; because if attempts were made to remove a placenta of this description by traction at the funis, as soon as the insertion of the vessel into its substance could be felt by the finger, — while the great part of its bulk was still in utero,—much danger might be induced, as will be shown in an after part of this publication.

THE FUNIS UMBILICALIS, UMBILICAL CORD, or NAVEL STRING, is a rope-like cord running from the navel of the child into the body of the placenta—a framework for the transmission of blood-vessels. It varies much in length—in some instances not exceeding six or seven inches; in others being more than five feet. Its average length may be regarded as from eighteen to twenty-four inches. It varies also in thickness, and this depends on the larger or smaller quantity of a viscid, semi-transparent gelatinous matter—the gelatine of Wharton—contained in cells, which constitutes the principal part of the thickness of the cord. These cells do not communicate with each other freely. Both the cells and the contained gelatine are evidently for the purpose of protecting the blood-vessels from pressure. Plate 27, fig. 2, shows a portion of the funis cut longitudinally: the dark spaces are the unoccupied cavities of the arteries and vein which coiled round each other; the lighter parts show the reticular cells filled with mercury. The preparation from which this drawing was taken, proves how slight the connexion between the cells must be; else, as the funis is suspended from one extremity in the spirit which preserves it, the mercury would run out by its own weight.

The funis gives a passage to three blood-vessels—two umbilical arteries and one umbilical vein. The arteries are longer than the vein, being considerably more tortuous, as I have already remarked in regard to the ramifications of the same vessels in the placenta; and they generally continue their course in a spiral direction, running round the vein; in the majority of cases being twisted from the left to the right. (Plates 26, 27, and 28, fig. 1.) They sometimes form simple turns upon themselves, as seen in plate 30, fig. 2, *a a;* at others they are twisted into fantastic convolutions, giving the external surface of the cord a knotty appearance, not unlike varices in the legs. (Plate 27, fig. 1, *a.*) They will then run for some length straighter and nearly parallel to the vein. Sometimes the funis itself is found in labour to be twisted into a loose knot; but this appears to me to be produced rather by the movements of the fœtus in utero, than to exist as an original complication. The vein is much greater in its calibre than the two arteries together; but as the latter vessels are perhaps twice the length of the vein, or more, owing to their tortuous course, the quantity of blood actually contained in the two arteries at one time may be nearly the same as in the vein.

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* In a MS. note-book that belonged to my late father, I find that in October, [illegible], he delivered a woman of twins, there being only one placenta and one bag of membranes; the funes were inserted *very near each other*. And on February 6th, 1840, one of my pupils at the London Hospital delivered a woman of twins when there was also only one bag of membranes.

The vein possesses no valves; and the arteries do not communicate with each other until they reach the placenta; when one generally sends off a large transverse branch to the other. The arteries carry adulterated blood from the body of the fœtus to the placenta, and have a very strong pulsation; the vein carries back again to the fœtus pure blood imbued with the principles of both vitality and nourishment. In some respects, then, these canals may be likened to the pulmonary vessels; but the umbilical vein, by transmitting the means of growth, as well as of the continuance of vitality, performs an office superior in value to the pulmonary veins, which give passage to fluid fraught with the principles of life alone. Whether much difference of colour exists in the blood transmitted by the vein and that circulating in the arteries, is a point not very easy to determine. Mayo* asserts that the colour of the blood in the umbilical vein is somewhat lighter than that in the arteries. Granville, Meckel,† and Blundell,‡ again, think there is no manifest difference, and the latter believes that both contain an equal quantity of carbon.§ But while we know that breathing life cannot be sustained without some alteration being effected on the blood through the influence of the atmosphere, and that even aquatic animals are furnished with

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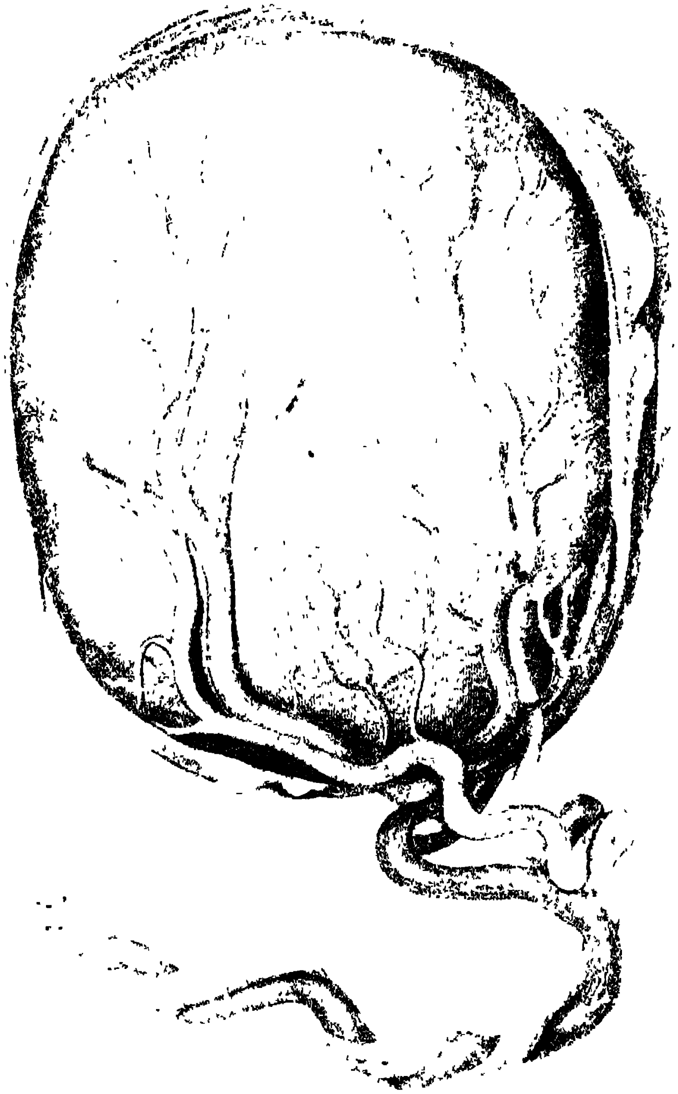
* See Granville, Op. cit. p. 20.

† Manuel d'Anatomie, traduit de l'Allemand, par Jourdan et Breschet, vol. iii. p. 794.

‡ Obstet. by Castle, p. 126.

§ The blood in both the arteries and vein is of an equally dark colour, or nearly so. (Churchill's Operat. Mid. p. 276.) Dr. Williams (Med. Gazette, March 1, 1843, p. 20) says, Müller has proved, by direct observation, that the blood in the vein is scarcely, or not at all, distinguishable in colour from that in the arteries.



organs for the express purpose of purifying their blood, it is not too much to assume that a similar change is required for preserving the vitality of the fœtus; and that this function is carried on by the placenta.

Although there is much variation in the *straightness*, or *tortuosity*, we very rarely meet with any variety in the *number* of the umbilical vessels. In each of two specimens preserved in the London Hospital Museum, there is only one umbilical artery, which is large in proportion; and Dr. Hunter[*] mentions that he had seen many instances of such deviation, but none in which there were two veins. Velpeau,[†] however, states that two veins have been met with, and refers to Guillemot[‡] for authority. As far as regards the arteries, I do not know of any case on record in which either of the internal iliacs sent off two umbilical branches, so as to form three arteries in the cord.[§] Both the blood-vessels and cells are covered by the amnion and chorion;—the amnion being here, as on the fœtal face of the placenta, external.

The rapidity of the circulation through the cord has been a subject of frequent discussion; and the probability is, that it differs much in different individuals, and in the same individual fœtus at different times. The number of pulsations generally ranges at one hundred and thirty or one hundred and forty in the minute;[||] but it seems that the fœtal circulation is greatly influenced not only by causes existing within its own system, but by accidental circumstances affecting the mother, and external agencies to which her person may be exposed. Both the mental passions and the loss of blood from the mother's body, with many other causes, have a decided effect on the fœtal pulse.

The funis is often found coiled round the neck or limbs of the fœtus; and this may embarrass us in practice.

When the embryo is first visible,—in the earlier weeks of utero-gestation,—we see nothing like a funis umbilicalis; but the newly-formed being is attached by its abdomen directly to the amnion.[¶] It appears first about the end of the fifth week: for some time it contains a much larger proportionate quantity of gelatine than during the latter months; and the vessels, which before were perfectly straight, (plate 22, fig. 3 *e*), assume a twisted character about the end of the tenth week.

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[*] Description of Gravid Uterus, p. 33.

[†] Traité de l'Art des Accouchemens, ed. Brux. p. 168.

[‡] Œuvres, fol. p. 336.

[§] Perfect (Cases in Mid. vol. ii. p. 286) mentions a case communicated to him, in which the funis was double, though there was only one child. He quotes Vander Wiel for an instance, where the child had two cords and two placentæ; and Schurigius for another, where there were two cords attached by a double insertion to one placenta.

[||] See Evory Kennedy on Pregnancy and Auscultation, p. 90.

[¶] This opinion, held by Hunter, has been controverted by Velpeau (Traité des Accouch. ed. Brux. p. 167), who says he has always been able to discover a funis, even in the youngest ova he has met with. See also Churchill (Operat. Mid. p. 262).

Disease.—The umbilical cord is liable to disease; the most frequent derangement in its structure, perhaps, is the secretion of too large a quantity of gelatine in its cells. This, if considerable, may obstruct the flow of blood through the vascular ducts, and occasion the death of the fœtus. Thus, a diseased condition of the funis may indirectly lead to abortion. Plate 23, fig. 4, shows an ovum, in which the funis is much greater in circumference than it should be, owing to there having been too much gelatine formed. It destroyed the life of the embryo; but the ovum was retained in utero for some time after the cessation of its vitality, as is proved by the thickness and solidity which the involucra have acquired.

URACHUS.—ALLANTOIS.—In the quadruped, besides the blood-vessels, there is another pervious duct running along the funis, called the URACHUS. This rises at the fundus of the bladder, passes out of the fœtal body at the navel, and accompanying the blood-vessels as far as the ovular membranes, continues its course till it terminates in a bag between the amnion and the chorion, called ALLANTOIS:[*] thus, the cavity of the bladder communicates with the allantois by means of the urachus. In the human subject there is no duct at the full period of gestation; but an impervious cord runs up from the fundus of the bladder, and is lost at the umbilicus. This is also called the urachus. It is not generally continued along the funis, though it may be sometimes traced upon the cord; and at the close of gestation there is no cavity between the ovular membranes answering to the allantois. Velpeau,[†] and other anatomists, indeed, have regarded the "albuminous space" that exists in the early ovum as the allantois,—it being placed nearly in the same position as that sac is in the lower animal. But, except in situation, the albuminous space possesses no analogy with the allantois of the brute creation, and less with that of the genus aves.

It is only in the very earliest period of gestation that the allantois can be discovered in the human subject. In an embryo of a few weeks old, while the abdomen is still open, it may be seen as a pyriform, vascular bladder, taking its origin from the pelvic extremity of the new being, and making its way towards the chorion.[‡] It eventually passes between that membrane and the amnion, and applies itself closely to the chorion. The blood-vessels that ramify upon it are continued along the villous prolongations of the chorion, seeking an attachment to the walls of the uterus by means of the deciduous membrane. When the abdomen of the fœtus closes, this pyriform sac becomes strictured at the navel, and in the same proportion as the umbilical cord is developed, it becomes pinched and compressed, and is gradually converted, first, into a long cylindrical tube, and afterwards into an impervious cord. That portion of the sac remaining within the body of the embryo is perfected into the urinary bladder:—that external to the fœtal body, between the amnion and chorion, soon disappears.

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[*] From ἀλλαντοειδῆς, shaped like an ἀλλᾶς, or sausage.

[†] Traité des Accouchemens, ed. Brux. p. 164.

[‡] In the human fœtus the allantois rises from, and communicates with, the rudimentary intestine, as delineated by Coste (pl. 3^a and 4) before the formation of the urinary bladder. Baly (Supplement to Müller, p. 87) says that when it has assumed the form of a vesicle, the allantois communicates both with the intestine and the Wolffian bodies, which are the rudiments of the kidneys.

The purpose which it serves appears to be to conduct the umbilical arteries and vein forward towards the external surface of the ovum; and by this means to establish the first communication between the vascular system of the mother and the embryo; and by this communication, to accomplish the formation of the placenta itself.[*] The acknowledged high vascularity of the membrane constituting this cyst—its carrying the vessels onward as it is created (which vessels are indeed the rudiments of the umbilical arteries and vein)—its creeping towards the chorion, and uniting itself indissolubly with that envelope; while the blood-vessels climb along its parietes, to reach the walls of the uterus; the appearance of vascularity in the villi of the chorion, as soon as it has become connected with that membrane,[†] and its rapid removal after the villous radicles have once imbedded themselves in the decidua, all tend to strengthen the idea, that the object of its formation must be identified with the production of a vascular connexion between the body of the young embryo and the maternal structures.[‡]

THE VESICULA UMBILICALIS, OR VESICULA ALBA, constitutes also a part of the ovum in its early stage.[§] It is a minute sac, not larger at its greatest magnitude than a small pea or large shot, situate between the amnion and chorion, possessing a pellucid coat, formed of two laminæ—an external vascular, and an internal mucous layer; and enclosing a small quantity of viscid transparent fluid, whitish, or, more generally, rather of an amber colour, composed almost entirely of albumen. The largest on record is mentioned by Lobstein:* this measured six lines in diameter. Its appearance is confined to a particular stage of pregnancy, being first noticed during the early part of the second month, according to most observers; but Velpeau † speaks of its being the size of a pea on the fifteenth or twentieth day from impregnation, and says that it has acquired its greatest magnitude during the third or fourth week. It is generally believed, however, to enlarge till about the beginning of the third month, when its contained fluid becomes thicker and opake; the vesicle itself then begins to dwindle in size, and speedily disappears altogether. Hunter, Meckel, and others, have observed it at the end of gestation. When, however, it persists longer than usual, it does not continue to increase, but at the close of pregnancy it is as small as it was at the end of two months.

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[*] Müller's Physiology, by Baly, p. 1582. Bischoff, Entwick. der Säugeth. und des Menschen. p. 129. Langenbeck Untersuchengen uber die Allantois. Gottingen, 1847.

[†] Baly's Supplement to Müller, p. 90.

[‡] Coste describes and depicts (pl. 2^a, 3^a, and 4) two umbilical veins, as well as two umbilical arteries ramifying on the allantois. He says that the right umbilical vein soon disappears, and that it is the left which persists to the end of gestation.

[§] Diemerbroeck (Opera, p. 304, Ultrajecti, 1672) first discovered the umbilical vesicle; but he described it as situated within the amnion. To Wrisberg (Descript. Anatom. Embryonis, Gottingæ, 1764) the merit is due of having first represented its true situation between the amnion and chorion.

From one extremity of the vesicle a duct is sent out to join the funis umbilicalis, becoming thinner as it recedes from the bag, until to the naked eye it is lost upon the cord itself. It may be traced, nevertheless, by the microscope, running along the funis, entering the body of the embryo, and eventually terminating in the cavity of the cæcum or in the ilium, just where the two intestines communicate with each other. The distance between the vesicle and that end of the funis farthest from the body of the embryo varies, being sometimes not more than half an inch, at others twice as much.

It is supplied with blood by a distinct artery and vein, called the *omphalo-mesenteric* vessels; the artery proceeds from the inferior mesenteric, passes between the convolutions of the intestines to the umbilicus, and thence along the funis; the vein arises from the walls of the vesicle, traverses the funis in company with the artery, and finally terminates in the superior mesenteric vein, before that vessel enters the porta. The omphalo-mesenteric vessels shrivel as the vesicle itself disappears. They have been observed, indeed, both by Chaussier and Beclard, in the funis of a full-grown fœtus, dwindled into white impervious cords.

The vesicula umbilicalis is doubtless subservient to the nutrition of the embryo during the first few weeks of intra-uterine existence. This is the explanation offered by Velpeau,‡ who supposes, as the fluid it contains is so highly nutritious, that it is intended to sustain the new being, until the cord and umbilical vessels are elaborated; or, indeed, until the ovum has become closely connected with the internal surface of the uterus. It is, according to him, analogous to the vitelline sac of the chick; which it resembles in shape, position, and connexion with the

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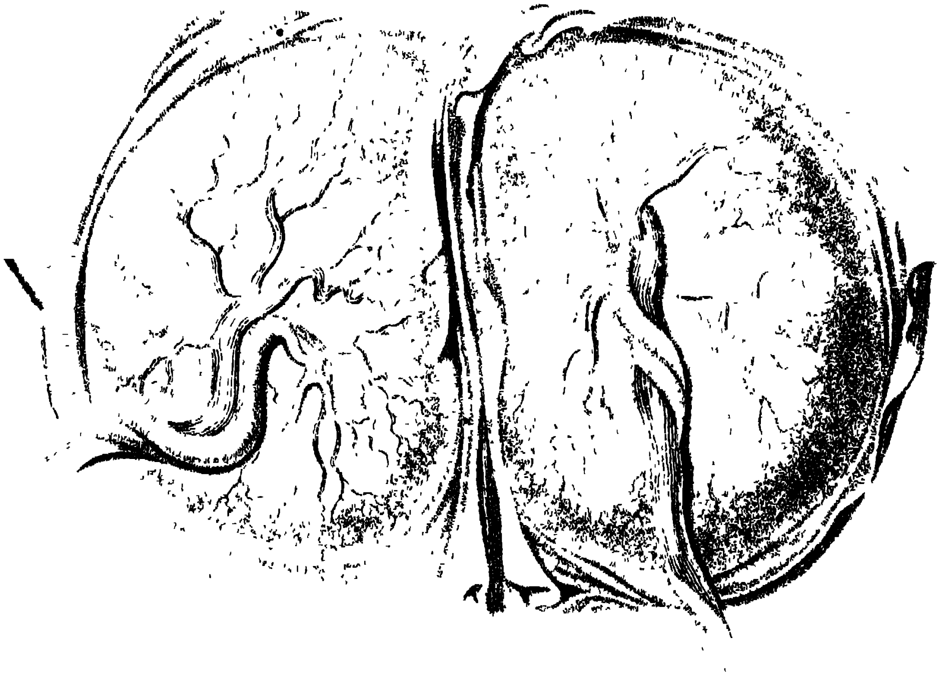
* Essai sur la Nutrition du Fœtus.

† Op. cit. p. 162.

‡ Ed. Brux. 1835, p. 164.



intestines, structure, and the character of the inclosed fluid.* We must acknowledge, however, that there is a material difference between the two; because, in the chick, the ductus vitello-intestinalis is constantly becoming shorter, until the whole bag is received into the abdominal cavity; while in the human ovum the vesicula umbilicalis is in close approximation to the abdomen of the embryo until the formation of the funis; after which its duct elongates as gestation advances; and it consequently recedes from, instead of approaching nearer to, the fœtal body.

In Plate 28 are represented two specimens of the umbilical vesicle. Fig. 2 shows the vesicle *c* floating loosely, detached both from the amnion *b* and chorion *a*; it is suspended by the duct containing the omphalo-mesenteric vessels: the embryo is seen enclosed in the amnion. This ovum I should consider to be between five and six weeks old, but I am not acquainted with its history. Fig. 3 gives the vesicle *a* in its natural position between the ovular membranes, its fluid having already become opake. This ovum is at least seven weeks old.

THE FŒTUS.

The different constituents of the ovum, which have been already described, are formed solely for the protection, preservation, and growth of the FŒTUS:—to its necessities all the other parts are contributory and subservient. At the end of gestation the fœtus ordinarily measures about twenty inches from the crown of the head to the heel, and weighs nearly seven pounds; but there is an amazing difference in both respects, particularly the latter; and the size is influenced by circumstances not very easily explained. Generally speaking, males weigh considerably more than females, and are longer by about half an inch.† Some children at full time have been known to weigh even less than five pounds; while many cases are on record where the weight exceeded double the average. Thus Baudelocque mentions that he had seen one child at birth which weighed twelve pounds, and another thirteen.[*] The late Dr. Merriman delivered a woman of a fœtus that weighed more than fourteen pounds.[†] Sir Richard Croft saw one born alive of fifteen pounds.[‡] Spence gives a case in which the child and placenta together weighed sixteen pounds Dutch weight, after the brain had been evacuated.[§] My father once delivered a woman of a fœtus that weighed sixteen pounds and a half avoirdupois.[||] Dr. Moore, of New York, states that in 1821 a child was born in that city that also weighed sixteen pounds and a half.[¶] And Mr. Bloxham delivered a child by the forceps, which weighed seventeen pounds twelve ounces; and whose length was twenty-four inches.[**] This, and that mentioned in the note, as far as I know, are the heaviest well-authenticated fœtuses on record. Of the three largest children I was ever myself at the birth of, one weighed fourteen pounds: this was a breech presentation, and the child was born dead: another twelve pounds and one ounce; this I extracted by the forceps; it was also dead: the last weighed twelve pounds and three quarters; this was expelled naturally; it gasped two or three times, but could not be restored.

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* "The umbilical vesicle and its duct are known to have the same relation to the intestine as the yolk-sac and its duct have in the chick. Hence the vesicula and the yolk-sac are to be regarded as completely identical." (Muller's Physiol. by Baly, p. 1575.) They may be identical in office; but they nevertheless differ in many material points. The vesicula umbilicalis in the human subject resembles the yolk-sac of the bird in the fact of its forming the chief bulk of the ovule before impregnation, in its connexion with the intestines by its duct, in its artery and vein having a similar origin and termination, and in its nutritive contents. It differs, inasmuch as it increases in size for a certain time after fecundation, which the yolk-bag of the fowl does not; in its never being received into the abdominal cavity; and in its duct becoming gradually longer, instead of shorter, until it begins to be absorbed.

† Prof. Simpson, in his essay in the Edinb. Med. and Surg. Journal, quoted at page 16 of this work, which will richly repay a careful perusal, says, that the average weight of 50 boys born in the Maternity Hospital at Edinburgh was 7lbs. 9 oz. 1 dr. each; and the average weight of 50 girls was only 6 lbs. 12 oz. The average length of the males was 20 inches 5 lines; the average length of the females 19 inches 10 lines. Dr. Jos. Clarke, in his letter to Dr. Price (Philosoph. Trans.

The usual position in which the fœtus lies in utero is the most easy, as well as compact, that could possibly be devised for a body of such bulk and irregularity. Its general figure is that of an oval, the long diameter being placed nearly perpendicularly as regards the trunk of the mother. The head is situated towards the os uteri, the vertex being the most dependent part; the chin is pressed upon the chest; the neck and back are bent into a curve; the nates lie at the fundus uteri; the thighs are flexed up

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1786, p. 358) states that he found the average weight of boys at birth to be 7 lbs. 5 oz. 7 dr.; and that of girls, 6 lbs. 11 oz. 6 dr. From this statement, we should expect to find, what really proves to be the case, that the birth of male children is attended, *cæteris paribus*, with more delay and difficulty than that of females, as well as that more boys are still-born than girls. But Dr. Simpson has further shown that many of those perilous casualties which complicate and embarrass parturition, occur more frequently to women giving birth to boys than to girls; and also that more boys perish in the first few weeks of extra-uterine life than girls. And he attributes, with apparent justice, this series of mischances mainly, if not entirely, to the larger size which the male fœtus at birth possesses over the female.

[*] L'Art des Accouchemens, parag. 432.

[†] Communicated to me by Dr. Samuel Merriman.

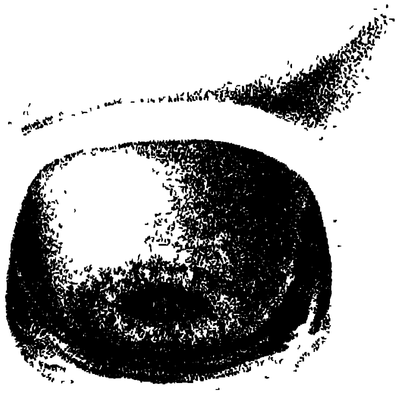
[‡] Communicated by the same gentleman. See also Hutchinson on Infanticide page 15.

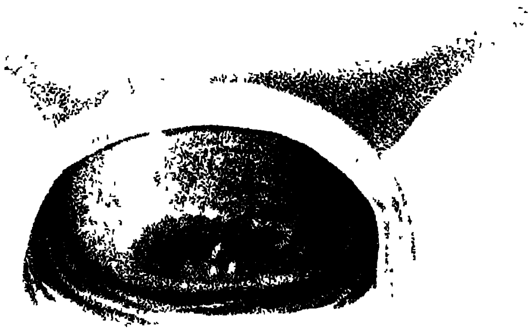
[§] System of Midwifery, case xxv.

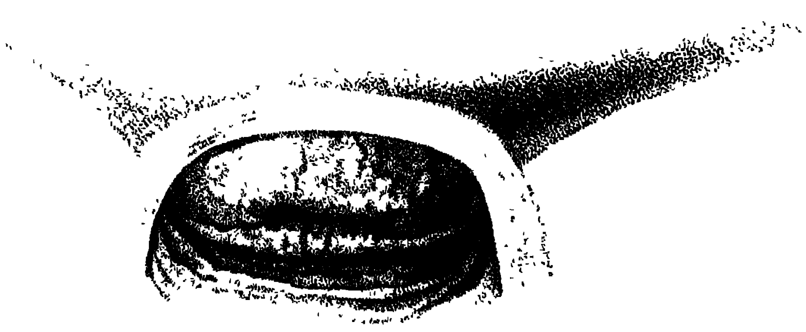
[||] Practical Observations in Midwifery, case liii., first edition, lv. of the second.

[¶] New York Med. and Phys. Journal, vol. ii. p. 20.

[**] Lancet, vol. i. 1838-39, p. 477. The case is reported by Mr. J. D. Owens. In the Med. Chirurg. Review, October, 1841, p. 427, there is the mention of a fœtus that weighed nearly eighteen pounds at birth.







towards the belly, and the legs somewhat turned back upon the thighs; the arms are crossed upon the chest; or one hand is placed by the side of the head, and the other on the chest or by the breech; sometimes both lie by the side of the head; or they may be otherwise variously disposed. Thus one end of the oval is formed by the vertex, and the other by the breech: and its adaptation to the cavity in which it is placed is most perfect.

In plate 32, the fœtus at maturity is seen folded as it commonly lies in utero. But the funis umbilicalis is there depicted twisted round the neck, which is not a very common occurrence.

The quantity of matter that is contained within the gravid uterus at the end of gestation, provided we allow seven pounds for the fœtus, one pound and two or three ounces for the placenta, cord, and membranes, and above a pound for the liquor amnii,—will be between nine and ten pounds in all. But this will differ not only according to the size of the fœtus and placenta, but also according as the water has been more or less largely secreted.

DEVELOPMENT OF THE UTERUS.

The uterus is constantly enlarging during the whole term of gestation, and its increase corresponds with that of the ovum; so that its growth towards the close of pregnancy is comparatively greater from week to week than at any other period. The fundus and body are first evolved; and the neck does not begin to expand until five full months have passed. Before this time the principal part of the organ is globular in shape, and the elongated cervix projects from it below, as is seen in plate 30, fig. 1, which is copied from Hunter's work, and represents the back face of the gravid uterus and anterior face of the vagina at the commencement of the fifth month. But in the sixth month the fibres of the uterine neck begin to develop themselves; they become, as it were, unfolded—the process commencing from above, and by degrees progressing downwards,—and at the end of gestation the cervix is so completely opened out, that it forms part of the general cavity. Plate 29 shows the gradual change taking place in the neck of the womb. Fig. 1 represents it at the end of the third month; fig. 2 at the end of six months; and fig. 3 just before labour begins. The enlarged glandulæ Nabothi are also well delineated; and the fissured character that the os uteri sometimes assumes towards the termination of pregnancy is seen in fig. 3.

The parietes do not become thinner as the uterus grows, but in many instances absolutely thicker. They are not distended by their contents as a bladder might be blown up; and the cavity is never so completely filled but that it would hold somewhat more than it contains. The enlargement is dependent on a process of healthy evolution; and if any pressure or distension from within occurs, as is the case when a preternaturally large quantity of liquor amnii is formed, much inconvenience and pain result.

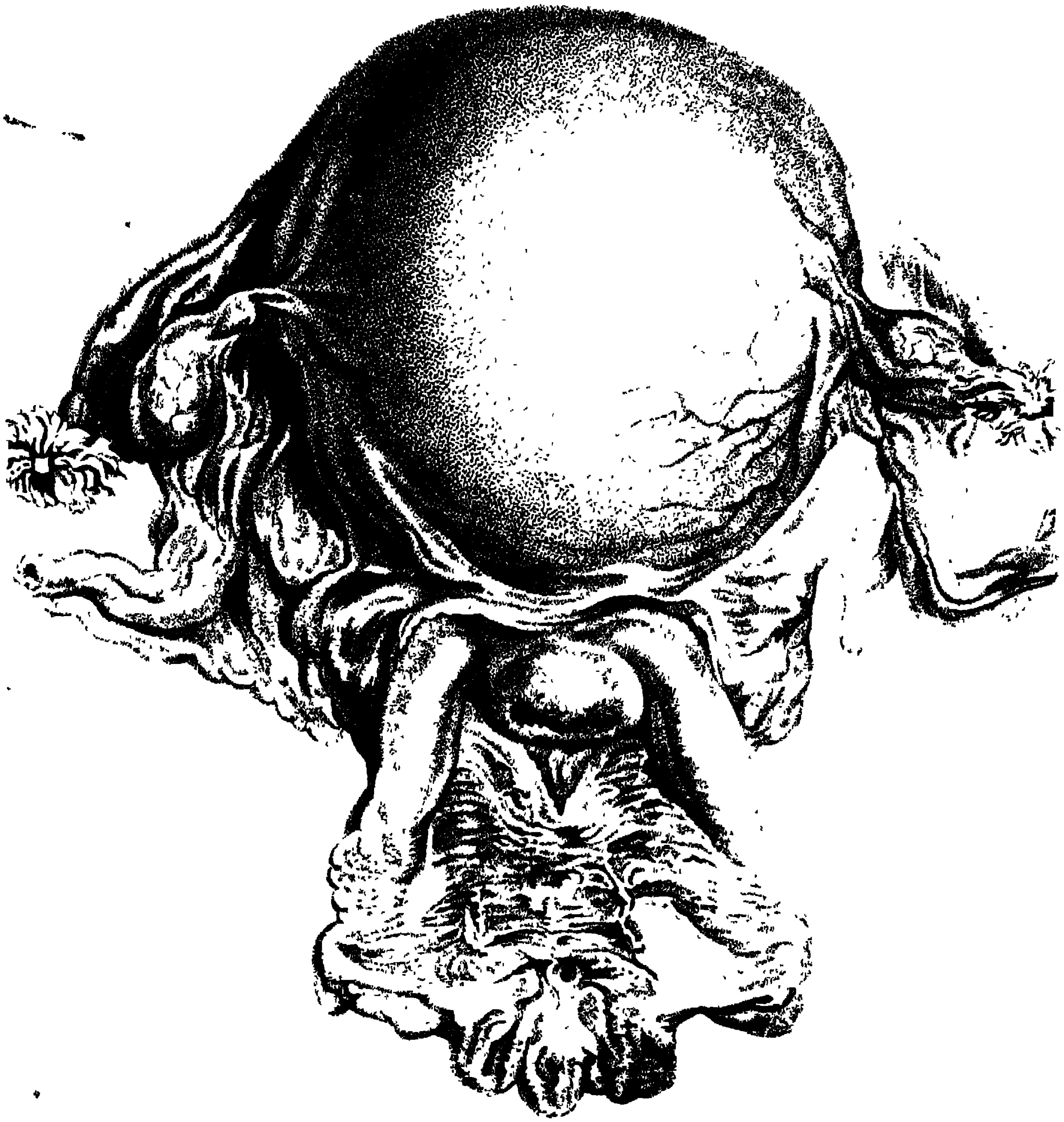
Great as is the increase of the womb in its general bulk, the blood-vessels undergo an enlargement even far more considerable in proportion; and this is explained by the fact that they have not only to nourish the parietes, but also to supply the wants of the growing fœtus. It is this circumstance which renders the texture of the gravid womb so loose and ductile; and the amazing diameter they have acquired before labour commences, most readily accounts for the violent hæmorrhages that not unfrequently attend on parturition.

This alteration in the size of the blood-vessels mainly contributes to the increase of the uterine parietes; there is nevertheless an additional quantity of both cellular and fibrous matter secreted, as the evolution proceeds. The nerves and absorbents also partake of the general enlargement; though not to so great a degree as the blood-vessels.

The increase of the uterus during pregnancy, extraordinary and peculiar as it seems, is nevertheless regulated by the same laws which govern the growth of every other structure in the animal economy. Fresh cells appear, the nuclei of newly-secreted fibres; these are gradually gathered into masses to form bundles; and the dense, firm, inelastic, comparatively lowly organised tissue, is converted into a powerful muscular fabric, possessing a degree of vascularity without a parallel in any other organ of the body.

For the first few weeks of gestation the uterus descends somewhat lower towards the outlet of the pelvis than the position it previously held; and this subsidence often occasions troublesome and annoying symptoms, such as pressure on the absorbents and veins, producing œdema and varices; and on the nerves, causing cramp. Nor do the bladder and rectum escape; and a frequent inclination to evacute the intestine, but more particularly constant calls to pass urine, are among the many distresses consequent on early pregnancy.

About the end of the fourth month it begins to mount from the pelvis into the abdomen; and its fundus may then be felt emerging above the symphysis pubis. The time of its residence within the pelvis, however, will much depend on the size of that organ. The smaller the capacity, the sooner will it rise; and if the dimensions be preternaturally large, it will remain a tenant of the cavity for a proportionably longer period. In its ascent it passes before



the intestines, carrying the omentum up above it; and when it has nearly acquired its extreme bulk, the colon lies along its fundus; and it encroaches in some degree on the space occupied by the stomach. (Plate 31.)

It is not to be supposed that these changes can go on in the uterus without the viscera in connexion with it being also materially affected in regard to their relative situations. Thus the neck of the bladder is somewhat drawn up with the neck of the ascending uterus. But the principal alteration is observed in the peritoneum, the Fallopian tubes, the broad ligaments, and the ovaries. The peritoneal covering is of necessity greatly extended in surface; and this depends partly on the formation of new membrane, a fresh secretion,—partly on its allowing itself to be stretched out in every direction (for it is highly elastic, as is shown in the variations of contraction and distension which the stomach, intestines, and bladder are constantly undergoing, and in the descent of that portion of the membrane which constitutes the sac in intestinal hernia);—and partly on the layers of the broad ligaments splitting, and receiving the sides of the uterus between their folds. This latter circumstance occasions the ovaries to be drawn nearer to the substance of the organ than they are in the virgin condition; while, from the same cause, both the broad and round ligaments run almost perpendicularly downwards to the pelvic brim, instead of horizontally, as in the unimpregnated state. The Fallopian tubes also, from the disposition of the ligaments, lie for some distance upon, and in close approximation to, the body of the uterus. At the termination of pregnancy, the womb measures about thirteen inches in length and eight or nine in breadth; and it has acquired an ovoid figure. (Plate 31.)

ON LABOUR.

WHEN gestation is completed, the uterus, which during the period of its growth was inert, allowing itself to be evolved and acquiring a surprising size, begins a new action, which constitutes the function of LABOUR, or PARTURITION. These simple terms designate a very complicated process, embracing the dilatation of the passages, as well as the expulsion of the ovum.

The principal agent in labour is the uterus itself; but it is much assisted in its action by the contraction of the abdominal muscles, and probably also of the diaphragm.

Under labour the fœtus is perfectly passive; so that a dead child is expelled, generally speaking, nearly with the same ease as a living one. The ancients, indeed, thought that the infant, by its own struggles, contributed a great share in procuring its freedom; and Ætius—who lived towards the end of the fifth century, and whose works principally consist of a compilation from those of previous authors—especially mentions the death of the fœtus as one cause of difficult labour; since it could give no assistance, by reason of its being still.* We may presume this was a prevailing doctrine before the time of this writer, and it continued so for many centuries after.†

The action of the uterus is perfectly involuntary, and consists in a contraction of the fibres embedded in its structure, which indeed form its peculiar parenchyma. These fibres obey in labour the laws of muscular action: their extremities are brought nearer together, and in the same proportion as their length is diminished, they become increased in thickness. Thus, inasmuch as the fibres run throughout the uterus, traversing it in all directions, every part of the uterine structure is lessened in extent, the capacity of the uterine cavity is decreased, and the internal membrane is brought into forcible contact with the contents. By this contraction pressure is exerted, propulsion is produced, and eventually expulsion is effected. Even after the child is born the same kind of contraction goes on in the uterine parietes, for the purpose of expelling the placenta, and of gradually closing the open vessels. It is by this contraction that hæmorrhage is prevented, and the safety of the patient in that respect ensured.

But the auxiliary muscles which assist the uterus in its contractions are in a great degree voluntary; so that labour may be said to consist of a mixed action; partly of a voluntary, but principally of an involuntary character: for the aid which the woman contributes by the exertion of her own will, is not to be compared to the propelling power of the uterus, which is entirely independent of her control.

The general features of labour are the same in all cases, but there is an infinite diversity in the details. Sometimes it is complicated with irregularities and dangers; it is always attended with more or less suffering, if the patient be conscious.‡ The duration of the process and the pain suffered vary much in different women, and in the same woman in different pregnancies. The pain endured is sometimes regulated by the strength of the uterine contractions; sometimes by the resistance offered to the child in its passage; but frequently it depends on the degree of irritability

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* Discourse 16, chap. xxi. of Cornairus' translation.

† Vide Mauriceau, livre ii. chap. 10.

‡ Under insensibility from apoplexy or puerperal convulsions, the uterus continues its contractions, though the woman is unconscious of pain; and the same remark holds good where anæsthetic vapours have been inhaled.

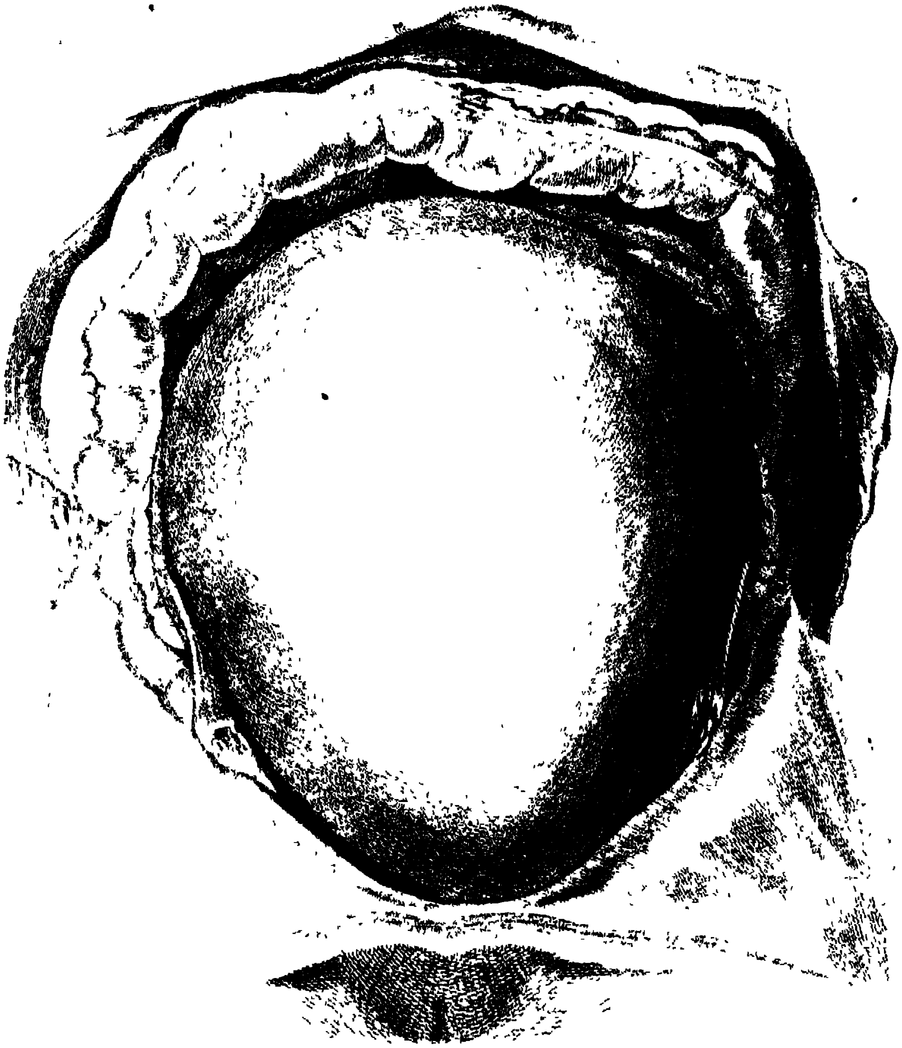
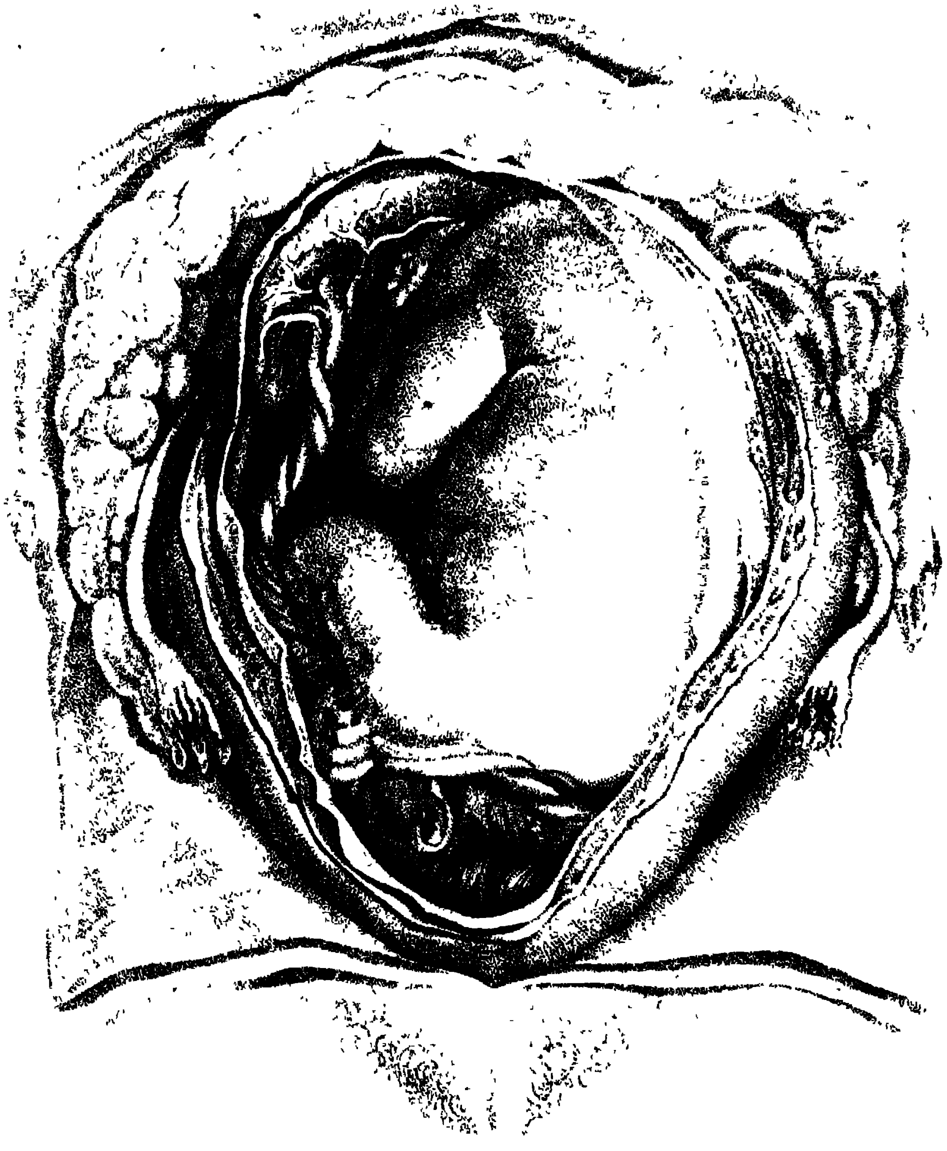


PLATE XXVII



or sensibility possessed by the uterus itself. There is no doubt that this organ in some women is much more sensitive than in others: and we may fairly presume that in the same woman it may be much more sensitive at one particular labour than at any previous or subsequent. It is almost superfluous to remark, that if inflammation of the uterus were to exist at the time of labour, the pain consequent on its contraction must be most materially aggravated.*

THE SYMPTOMS OF LABOUR may be classed under two heads:—those which are indicative of the approaching crisis,—and those which intimate that the process has actually commenced.

The symptoms indicative of approaching labour are, first, a subsidence of the uterine tumour;—secondly, an increased moisture and laxity of the vagina and external organs;—thirdly, a peculiar degree of mental anxiety.

1st. When about eight months and a half of utero-gestation have passed, the uterus has acquired, not perhaps its largest size, but its greatest height in the person; its fundus has then pretty nearly reached to the ensiform cartilage. But at the end of nine months it has generally sunk back to the situation which it occupied at the end of eight; so that its fundus may be felt half way between the ensiform cartilage and the umbilicus. This diminution in volume occurs, indeed, sometimes suddenly—during the course of one night, for instance,—and the woman, on rising from her bed, is surprised to find herself so much less than she was the day preceding. But more frequently it is gradual, almost imperceptible from day to day, but sufficiently obvious after the lapse of several. It is partly produced by painless contraction going on in the uterine fibres themselves, and partly by the subsidence of the organ within the pelvic cavity. It is to be regarded as a good symptom, for it shows us that labour is disposed to commence in a natural manner; and also—especially is this knowledge valuable in a first pregnancy—that the woman has a tolerably roomy pelvis; for if any portion of the head will enter the brim, while covered by the cervix uteri, it is reasonable to expect that it will readily descend into the cavity when the os uteri is dilated. It is a remark constantly made by women when within a day or two of their confinement, that they are both smaller in size and feel lighter and more active in their persons than they had done for some weeks before. This is, however, by no means an universal occurrence, and it is not to be looked for in cases where there exists a contraction of the pelvic entrance.

2nd. The second indication of approaching labour is increased moisture, relaxation, and distensibility of the vagina and external parts, together with some slight tumefaction of the vulva, the consequence of a larger supply of blood being determined to these gans. This is very apparent not only in the human female, but also in the brute creation. It is very usual; and this too is a good symptom, because it shows that there is a disposition in the passages to become relaxed and open, as well as in the uterus to contract. It is dependent on one of nature's unerring laws. Some physiologists would teach us to believe that dilatation in labour is *entirely a mechanical act*—that as the uterus contracts it propels the head first through the os uteri, by dilating it mechanically, then through the vagina, and lastly through the external parts, solely by the same forcible distension. It is evident from the structure of the organs that a mechanical dilatation to such a great extent never could take place, unless a corresponding disposition to relax were given them at the same time; and therefore we must consider the dilatation of the passages *not entirely dependent on mechanical distension;* but that it is in a great measure to be referred to that institute of nature which induces them to become relaxed and softened, when the uterus is about to commence contraction.

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* Professor Meigs, of Philadelphia, thinks rheumatism of the uterus towards the close of pregnancy "far more common than has generally been supposed." (Treatise on Obstetrics, 1852, p. 299.)

3rd. The third indication of approaching labour is drawn from the state of the mind. We often observe that many days before any painful sensation is experienced, there is a degree of *fidgetiness* or anxiety for the result of the case. This is more strikingly marked in the lower animal than in the human subject. Woman has reason to sustain and guide her; she is confidently impressed with reliance upon a Supreme Power; she has the opportunity of calling to her aid the soothing comforts of religion; but the brute possesses none of these advantages. In our common domestic animals—the bitch, the cat, and others, whom we can watch narrowly prior to the commencement of parturition—we observe that a day or two before the process actually begins, they appear in great distress; their cries are evidently not those of pain, but —if we may allow it them—of anxiety; and they busy themselves in preparing a bed to which they may retire, when *their time* comes. The same mental distress may be remarked in the female of our own race, modified and controlled by reason, fortitude, and religion.

The symptoms which indicate that labour has actually commenced are, first, irritability of the rectum and the bladder; secondly, nausea and vomiting; thirdly, rigors or tremors unattended with any feeling of cold; fourthly, a glairy discharge from the vagina, tinged with blood; and fifthly, painful sensations. These are enumerated in the inverse order, in regard to their importance as diagnostic signs.

1st. The frequent inclination to pass urine and fæces, dependent on irritability of the bladder and rectum, arises from the contiguity existing between these organs and the os uteri, the deriving a portion of their nervous supply from the same source, and the consequent sympathy, through which they mutually affect each other. They are very usual symptoms of commencing labour, and are to be attributed to the process of dilatation going on in the os uteri. A desire to evacuate the bladder will, perhaps, occur every ten or fifteen minutes, although there be scarcely any fluid in it. Medicines are of little avail in this species of strangury; but the feeling mostly disappears as soon as the mouth of the womb is tolerably well dilated; so that before the head comes to occupy the pelvis it has generally ceased. The same remark may be made with regard to the tenesmus. This symptom is more distressing than the irritation at the neck of the bladder, and it may sometimes be relieved by a simple demulcent injection: if the patient be suffering much annoyance from it, and the labour is progressing but slowly, a few drops of laudanum may be added to the enema with advantage.

2nd. Nausea and vomiting very frequently—indeed, almost always—attend on the dilatation of the os uteri: and we have opportunities constantly afforded us of remarking that these two actions bear to each other the relation of cause and effect. It is by no means unusual to find, when the os uteri is rigid during the first stage of labour—when it evinces little disposition to dilate or relax—when this state has continued for hours, and when very little progress has been made in the interval, even although the pains may have been both frequent and strong;—that on a sudden attack of vomiting supervening, not referable to any external cause, a favourable change is speedily produced in the uterine mouth; it has become softened, relaxed, and is dilated; and the process goes on from that time with comparative rapidity. Hence, vomiting at the early part of labour has been looked upon as a good symptom. And it has even been recommended, in cases rendered lingering by rigidity of this organ, to give emetics for the purpose of exciting sickness, under the impression that the act of vomiting was the *cause* of the relaxation taking place. It is not the cause, but the *effect* of that relaxation; so that the artificial production of vomiting is not followed by the good anticipated: emetics are now, indeed, seldom had recourse to with a view of forwarding the dilating process; although nauseating doses of antimony are sometimes employed with beneficial results.

The matter ejected under this attack of vomiting is merely what the patient has lately taken into the stomach, mixed with the healthy secretions of that viscus, and perhaps with a little bile.

The effort itself is not attended with much straining: it is more inconvenient than painful. It seldom lasts any length of time:—there are a few paroxysms, and then it ceases. Sometimes, however, it will continue to distress and harass the patient for many hours. In such cases it may perhaps be dependent on a deranged state of the stomach itself, or some other cause, besides the sympathy existing between that viscus and the os uteri. The exhibition of an effervescent draught, with five or six minims of laudanum, will then be found the most serviceable as well as grateful medicine. But in ordinary cases no remedies will be required.

Vomiting at the *commencement* of labour, then, may be regarded in a favourable light, rather than otherwise, as indicative of the softening process going on in the os uteri. But it behoves us to discriminate most carefully this kind of vomiting from that which takes place under protracted labour,—long after the first stage has terminated, and when the system is worn out and exhausted,—which, indeed, is one of the very worst signs we can observe. There is not much probability that a mistake should be made in this particular;—the one appears early in the labour; the other after the patient has been in pain for many hours:—accompanying this there are no symptoms of exhaustion; the woman is in good spirits, the pulse is not much accelerated, and the countenance is not dejected; with the other there appear progressive symptoms of urgent distress, which will hereafter be specially enumerated. The matter ejected from the stomach would also be a guide, if any doubt existed. In the first kind it consists of what the patient has last taken mixed with the natural secretions; when it is the effect of exhaustion, it is a deranged secretion—and this is sometimes formed in astonishingly large quantities;—and in the worst cases it is fœtid, dark in colour, of a greenish cast, or, like the matter vomited in the last stage of typhus fever, possessing somewhat the appearance of coffee grounds.

3rd. Another symptom frequently accompanying the commencement of labour is the occurrence of shivering, or tremors unattended with any sensation of cold. This also is dependent on the opening of the os uteri. Such rigors are seldom distressing; the patient pays but slight regard to them;—she perhaps feels a little chilly, or shivers in a trifling degree, and she may experience many cold fits; but when the os uteri is dilated they disappear. They are neither connected with any irregular arterial action, nor with pain in the head or other bad symptom. Sometimes, indeed, they are sufficiently intense to shake the bed on which she lies, and cause her teeth to chatter as if she were in the cold stage of an ague fit; and although she complains of being very much chilled, the surface may be warmer than natural.

It is scarcely necessary to use any other means than to add an extra covering to her person, and exhibit any warm diluent that she fancies.

This simple shivering must be distinguished from that state which the frame is violently agitated, and which is a species convulsions of the most dangerous character, that will come under consideration in a subsequent part of this work.

4th. The next symptom to be noticed, is a discharge from the vagina of a glairy character, tinged with blood, technically termed, in the language of the lying-in-room, *a shew.* It consists of an increased secretion from the vaginal surface, mixed with the gelatinous mucus which had previously blocked up the uterine neck, and which is allowed to escape when the os uteri opens; and of blood poured out from those small vessels of the os and cervix uteri, which ran into the deciduous membrane, and which are rendered patulous by the separation of that membrane, as soon as the dilatation of the womb commences.

This is a stronger symptom of labour having commenced than any I have yet mentioned. When, indeed, this "shew" takes place at the full period of pregnancy, or near it,—especially if it be attended with periodical pains,—we may be almost certain, even before we make an examination, that the process has actually begun. A considerable loss of blood towards the close of pregnancy will be sometimes called by the same name. Such hæmorrhages, however, are by no means to be regarded as indications of parturition, unless there be observed mixed in the discharge the glairy gelatine that had before occupied the cervix uteri.

5th. But of all the symptoms announcing the access of labour, pain is the most prominent. This is produced by the contraction of the uterine fibres, and is referred from the uterine region to the loins, to the upper part of the sacrum and the inner side of the thighs. Labour-pain is merely the external evidence of uterine action; and the two phrases are used synonymously as well by all writers as teachers of obstetric medicine. The sensation of pain is occasioned partly by the sensitiveness of the uterus itself, partly by the resistance offered to the parietes of the organ by the uterine contents, during contraction, and partly by the pressure of some part of the ovum against the os uteri and vagina under the process of dilatation. So that it has three sources — one dependent on the simple action which, like the spasmodic contraction of muscles, is attended with suffering—another, that of opposed propulsion — and the third, that of distension of the passages. As a general principle, it may be said that the stronger the uterus acts, the greater is the pain. In some women painful sensations accompany the very first commencement of dilatation, before the os uteri has attained a diameter sufficient to admit the point of the finger: in other instances, the organ will have been opened to a considerable extent before any pain is experienced; so that labour has made great progress unobserved and unnoticed. These are the cases in which it is supposed that the whole process has been completed by the effect of three or four pains. We cannot imagine that such complicated actions could be perfected by so slight an effort; and we have proof to the contrary daily presented to our observation. The explanation is easy, on the ground that dilatation has been accomplished without any sensation of pain; and that the *expulsive efforts alone* have been attended with suffering.

Uterine action, and therefore labour-pains, may be suspended or removed by many causes; opiate medicines taken into the stomach, injected into the rectum, or rubbed upon the surface of various parts of the body, will usually abate the contractions in a greater or less degree. Passions and emotions of the mind, as fright or sudden surprise, but especially those of a depressing character, such as deep grief, or more transient sorrow, will also produce the same effect. Even so comparatively trifling a circumstance as a stranger entering the room when the patient expected her own attendant, has been known to put a stop to labour, in the midst of its most active operations, and to suspend it for many hours. It is principally on this account that we are careful to prevent a woman in labour becoming suddenly acquainted with any news that is likely to shock her.

Labour-pains are not constant, but periodical; they intermit with intervals of ease, as the contractions alternate with relaxations. When the uterus is inactive, there is neither any pressure against its contents, nor any forcing of them through the os uteri, and the painful sensations for the time cease.

At the commencement there is merely a feeling of uneasiness; and when active pains first begin, they are short, weak, and occur at long intervals; by degrees they become more frequent, longer, and stronger; till towards the end of the birth there is one continued effort at expulsion, lasting, perhaps, for three or four minutes uninterruptedly.

The contractions of the uterus are attended with different sensations, as also with a different expression of suffering at the different periods of labour. Those pains which depend on the dilatation of the os uteri are described by the woman as being of a *grinding* or *cutting* character. They are accompanied by a moaning noise: if the patient be walking about the room, she will rest on her attendant's arm, bend herself a little forward for a few seconds, utter a subdued, grumbling noise, and then resume her exercise; or if she be sitting in a chair, she will shrink, as it were, into a smaller compass, press the elbows of the chair with some degree of force, give utterance to the same kind of moaning so[illegible]nd, and gradually stretch herself out again. When, however, dil[illegible]tion has gone on to such an extent as that some portion of [illegible] contents of the uterus is propelled through the mouth low down into the vagina, the pains become of a *forcing* nature; and the expression attending them is very different from that just described. Under these expulsive pains the breath is held in, and the patient forces down and strains as though she were passing hardened fæces. She gives no audible evidence that she is in pain, or perhaps she will make the smothered noise which is usually attendant on a great effort; until towards the close of the paroxysm, when an expression of more acute suffering is manifested. And when the head is resting on the perineum, distending the external structures, and just about to pass out, she cannot restrain herself from permitting a loud shriek, or kind of wild cry, to escape her.

SPURIOUS PAINS. — But the presence of pain, even if it be periodical, is not always symptomatic of labour having begun; for towards the end of gestation, women are subject to pains in the loins and abdomen, simulating true labour-pains in some respects, but not connected in any way with uterine action: hence they are called *spurious* or *false pains*. Sometimes they are confined in their situation, at others they are erratic; sometimes they return at tolerably certain intervals; more frequently they are very irregular in their recurrence. They are often connected with dyspeptic symptoms, and sometimes attended with involuntary spasms of the diaphragm and abdominal muscles, which cause the woman to bear down and believe herself in labour. Occasionally, also, a copious watery secretion from the glands of the os uteri occurs, so as to give an idea that the membranes of the ovum have broken; at other times an involuntary gush of urine takes place under the pains, which has often been mistaken for the liquor amnii. If it be urine that passes, it may easily be distinguished by the odour; if a secretion from the glandulæ Nabothi, it will be observed to dribble away slowly, rather than to be evacuated with a sudden burst.

False pains generally come on at night; and not unfrequently they will annoy the patient for weeks before the commencement of real labour, harassing her much by their severity, and preventing her obtaining any sound, refreshing sleep. At others, they appear only a few hours prior to the accession of true uterine action; and in the principal number of instances they are wanting altogether. They are more frequently met with in primary pregnancies than afterwards.

Causes. — Both the seat and causes of false pains are very various. They may be situated in any of the pelvic or abdominal viscera, or in any of the muscles of the lower half of the trunk. Thus the iliaci interni, the psoæ, the abdominal, or the external muscles of the back, may any of them be affected with spasm, consequent on too long a walk, or over-exertion, or fatigue of any kind; and these pains are not unlike the throes of parturition. Organic disease of the kidneys or bladder, or a prolapsed state of the latter viscus below the cervix uteri, may also occasion the same distress. But the most frequent cause is irritation existing in the lower bowels, or an irregularity in the action of the intestinal canal throughout. Diarrhœa, the evolution of a large quantity of gas, and more particularly constipation, are, of all the many causes, those to which false pains may be most usually traced.

Diagnosis.—It is only in sensation, however, that spurious pains bear any affinity to those of parturition. They differ in their seat, in the irregularity of their return and duration, and in their intensity not progressively increasing; moreover, they are seldom attended by any of the other symptoms which usually accompany the pains of labour. False pains, then, may be distinguished by their situation: instead of commencing at the lower part of the loins, and being extended to the abdomen and thighs, they are probably felt higher up in the back, or towards one or other side;—by their shifting their position; it is seldom that they are constant to one spot; they are mostly erratic;—but they may especially be known by the length of their duration and their irregular returns. Thus, true pains at the beginning of labour are short, weak, and the intervals between them long; and they increase in frequency and intensity as the process advances: false pains, on the contrary, observe no kind of regularity, either in regard to the periods of their return, or to their progressively becoming more frequent or severe.

But the best criterion by which we can distinguish the true from false pains is an examination of the uterus externally through the parietes of the abdomen, and internally by the vagina. If the pains be those of uterine contraction, our hand placed upon the abdomen will detect the uterine structure becoming harder, firmer, denser, and somewhat smaller, with each pain, until it arrives at its acmé; it then more or less slowly relaxes, and acquires the same degree of flaccidity which it possessed when the hand was first applied.

Yet it is not in every case where the abdomen becomes harder under pain that uterine contraction is the cause; for it not unfrequently happens that the alteration so perceptible to our sensation is occasioned by spasm of the abdominal muscles. If the fibres of these muscles act irregularly, and embrace the uterus closely, the compression which it undergoes communicates to the hand a deceptive feeling of progressively increasing hardness, as though it were itself contracting; and it is almost impossible to discriminate, by the external application of the hand, between the one cause of pain and the other. But an examination *per vaginam* will at once clear up the difficulty. If, in the inquiry thus instituted, we find the os uteri at all open—even should its diameter be not larger than will admit the point of the finger—if we find that with each pain its edge becomes stretched like a cord around the membranes which are protruded through it—if we find that the membranes are propelled downwards, and become tense with each pain, retreat and become flaccid when the pain goes off—and if with the recession of the membranes we observe that the os uteri also regains its original flaccidity, we may be sure that the tense condition is produced by a propulsion of the uterine contents, and this can only be effected by a contraction of the uterine fibres: so that such pains are certainly those of labour.

But if, on the contrary, we discover that the mouth of the womb is perfectly close—that there is no attempt at dilatation—no possibility of introducing the finger within it, and yet the patient is complaining of violent pains, and using bearing-down efforts, we may be equally sure that the suffering she is enduring does not arise entirely, if at all, from uterine action. Still it is possible, and not unlikely, that the os uteri may be opened to some extent, that we may be able to feel the presenting part of the child; and the pains, notwithstanding, may be spurious—active labour may not have come on. Even here we may distinguish the true cause by ascertaining whether with each paroxysm the disc of the os uteri becomes tense, and whether at the same time the membranes protrude. If there be no change in the os uteri, even although it will readily give passage to the end of the finger, and if there be no propulsion of the membranous bag when the pain is urgent, that pain is assuredly not the result of uterine action.

Whenever any doubt exists, it is necessary that these examinations should be instituted,—first, of the abdomen, and then of the os uteri, in order to make the case clear. It is probable that, by merely laying the hand on the uterus externally, we may be satisfied that it is not uterine pain; but if that proceeding does not bring conviction, it is right gently and delicately to insist on making an internal examination. The woman may object to this examination being instituted; but the information we gain by this simple proceeding is so useful, may save so much anxiety and distress, and so materially regulates our practice, that, if deemed absolutely necessary—and unless this be the case, indeed, we ought not to propose it—the point should never be given up.

Many a day and night have been spent in anxious watching over a patient, to the great inconvenience of the practitioner, to the destruction of his rest and health, and, perhaps, to the detriment of his professional character, when there was not the slightest necessity for such close attendance, simply because the patient would not acquiesce in the requisite examination being made.

Treatment.—Since spurious pains are so distressing, since they are producing no good, and since they may so undermine the patient's powers that she may not have strength enough left to go through the fatigues of labour, it is our duty, if possible, to remove them; and the best treatment for that object is rest in whatever posture is most easy, acting pretty freely on the bowels, and the exhibition of opiates, either by the mouth or by injection. If the bowels be loaded, as is most usually the case, opium, in the first instance, will do more harm than good; but after the evacuation of the intestinal canal, that drug is highly useful. Recourse also may be had to opiate liniments applied to the back, thighs, abdomen, or any other part where the pain is most intense. In plethoric habits, or if there be present inflammatory symptoms, it may be proper to take blood from the arm; but as a general principle, bleeding will not produce permanent alleviation.

In first pregnancies, these spurious pains are often produced by an unnatural rigidity of the abdominal muscles, which do not yield as they ought to the enlarging womb. The best means of relief under such circumstances will be found in gentle friction with some emollient application. Care must be taken, however, that this practice be not carried beyond proper bounds; for friction over the abdomen tends to produce uterine contraction, and I have known more than one instance in which liniments rubbed on the part in pain with more than necessary assiduity, and with less than ordinary caution, have excited the premature expulsion and consequent loss of the fœtus.

CLASSIFICATION.[*]

For practical purposes, labours may be conveniently divided into four classes:—

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[*] Almost every systematic writer on the subject of midwifery, since the time of Hippocrates, has adopted some classification of labours, accordant with his own views. The great father of medicine himself was contented with two classes—*natural*, when the head or breech presented; and *preternatural*, when any other part of the child offered itself. Smellie, to this simple arrangement, added a third class—*laborious;* and in some degree changed the meaning of the term used by Hippocrates. He calls that a natural labour in which uterine action alone accomplishes delivery; that case laborious, in which manual or instrumental means becomes necessary;—and that preternatural, when the birth of the trunk precedes that of

1st, Natural.
2nd, Difficult or Laborious.
3rd, Preternatural.
4th, Complex.

The first class, or natural labour, admits of no subdivisions; and it may be defined, a case in which the head of the child presents;—in which not more than twenty-four hours are occupied from the commencement of true uterine action to the termination of the process;—in which nothing extraordinary happens, nothing of a dangerous or alarming tendency supervenes throughout the whole conduct of the case. And that labour is deemed natural, in the acceptation of the term which I offer, if any part of the head present, even although it be the forehead or face itself, provided all the circumstances enumerated concur.*

The second class—laborious—is divided into two orders:

A, Lingering.
B, Instrumental.

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the head. Baudelocque also divided labour into three classes: *natural*, comprehending all cases which are terminated by the natural powers, whether the head, breech, or inferior extremities present, *preternatural*, those which require the help of art, but which may be performed by the hand alone; and *laborious*, when instruments become necessary to terminate the delivery. Dewees, after passing a high compliment on Baudelocque, follows his arrangement, but divides instrumental deliveries into two orders— the one accomplished by instruments which do no injury either to the mother or child; the other by cutting instruments, applied either to the fœtal or maternal body. Davis makes four classes: *natural*, when the head presents; *preternatural*, when some other part offers itself; *complex*, when accidental circumstances of an embarrassing nature occur; and *instrumental*. Blundell prefers five divisions: *natural*, when the head presents, and the whole labour is terminated in twenty-four hours; *preternatural*, when some other part of the child is the presenting part; labours with *flooding*; *laborious*, when instruments are required; and *anomalous*, when some extraordinary symptoms are superadded. Ashwell makes three: *natural*, *difficult*, and *flooding*. Merriman arranges all labours under two classes only: *eutokia*, (ἐν, easily, happily, and *τόκος*, labour,) and *dystokia* (δὺς, with difficulty, and *τόκος*), but in the second he introduces fifteen orders, embracing every circumstance that can in any way render the case tedious, difficult, or dangerous. Conquest includes all labours in two classes—*natural* and *preternatural*; and divides the second class into six orders. Power classes them also under the two heads *eutokia* and *dystokia*; and he divides the latter class into three orders—*nervosa*, *mechanica*, and *accidentalis*, into which he introduces twenty-four genera. Ryan makes four classes—*natural*, *preternatural*, *manual*, and *instrumental*: which he subdivides into forty-three orders. Burns multiplies the classes to seven—*natural*, *premature*, *preternatural*, *tedious*, *laborious*, *impracticable*, and *complicated*; all of which terms are sufficiently plain to convey their own meaning. The arrangement I have adopted is Denman's, so far as regards the classes (which Hamilton and Lee also employ); but I have made some alteration in the subdivisions.

* Many authors have regarded natural labour as much more contracted in its features. Thus Mauriceau considered it essential that the fœtus should be living; Burns, that it should have arrived at intra-uterine maturity; Baudelocque, that the vertex should present; Merriman, Burns, and Campbell, define it a vertex presentation, under which the face turns into the hollow of the sacrum, before expulsion. There is some difference also in the limit, with regard to time, proposed by different writers: thus Dr. Cooper restricts the period to twelve, and Power to six hours.

To constitute this class, also, it is necessary that the head should present: and the first order defines those labours in which, under a head presentation, more than twenty-four hours are occupied from the commencement to the termination of the case; but in which there is no necessity for instrumental interference, and during the progress of which no dangerous symptoms arise—nothing calling for anxiety occurs, except the unusual lapse of time.

The second order of this class—*instrumental*—embraces all cases of head presentation which require to be terminated by instruments. It includes two species:—

a, those cases which can be managed by the use of instruments perfectly compatible both with the life of the child and of the mother, as well as the safety and continuity of the mother's structures; such as are terminated by the forceps or vectis.

b, those in which we are compelled to have recourse to instruments incompatible either with the life of the child, or with the safety and continuity of the mother's structures—labours, indeed, which are completed by cutting instruments.

Of this latter species there are two varieties:—

α, some in which the instruments are applied to the fœtal body; as when the case is terminated by the use of the perforator.

β, those in which the mother's structures are divided by the scalpel, or some such instrument, as in the Cæsarean or Sigaultean operations.

THE THIRD CLASS—PRETERNATURAL LABOURS—or, in common language, CROSS BIRTHS, includes all cases in which any other part of the child's body than the head presents—the breech, feet, knees, back, belly, sides, shoulders, arms, or hands. In this class, we recognise two orders:—

A, all those cases in which the lower end of the oval formed by the doubled fœtal body, offers itself, viz., the breech, or some part of the inferior extremities, as the feet or the knees.

B, those others in which neither the head, breech, nor any part of the lower extremities present. Such are transverse presentations, to which, indeed, the phrase *cross births* ought in propriety to be restricted;—breast, abdomen, side, back, shoulder, neck, elbow, and hand presentations.

INTO THE FOURTH CLASS—COMPLEX LABOURS—may be admitted all those cases which cannot be referred to any of the foregoing divisions; since there are peculiarities appertaining to each which render them both complicated and embarrassing. This class will embrace eleven orders, most of them attended with danger, and all with irregularities.

A. Labours complicated with dangerous hæmorrhage.
B. ——— ————————— convulsions.
C. ——— ————————— rupture of the uterus.

D. Labours complicated with lacerated vagina.
E. ———————————— ruptured bladder.
F. ———————————— syncope unconnected with uterine floodings.
G. ———————————— descent of the funis before the head or breech.
H. ———————————— descent of one or both hands with the head or breech.
I. ———————————— an excessive quantity of liquor amnii.
K. Labours in which monsters are produced.
L. Labours complicated with plurality of children.

Three circumstances must strike the attention on this enumeration: first, that there are a number of cases assembled together in one class, without their possessing any affinity to each other; secondly, that some of them are in the highest degree dangerous, while others must not be considered more than ordinarily so; and, thirdly, that in some of them the danger or irregularity is referable to the parent, and in others to the child, or some part of the ovum. Thus in cases of laceration and convulsions, the cause is to be sought in the system of the mother; but where the funis or hand descends by the side of the head or breech, the irregularity is referable to the ovum, and the cause may be attributed to the arrangement of the contents of the uterine cavity. Each of these orders might indeed be considered a separate class; but I think it better to comprehend them under one general head, in order to prevent a multiplication of classes, which in all nosological arrangements must be both inconvenient and perplexing.

STAGES OF LABOUR.

Most writers agree that it is desirable, for the purpose of clearly understanding the process, to divide labours into certain parts or *stages*; but as there is much difference in the classification adopted by different teachers, so also a diversity has obtained in the number of these stages; some preferring three, as Denman, Hamilton, Blundell, and most modern teachers; others four, as Merriman, Velpeau, Romer of Zurich, Bard of New York; and others again, five, as Hogben, Naegele, and the German school;—all these stages terminating on the removal of the placenta. I think Denman's arrangement by far the best for practical purposes, and shall therefore describe labours as consisting of three stages; the first terminating with the opening of the os uteri to its full extent, the rupture of the membranes, and the evacuation of the liquor amnii; the second, with the birth of the fœtus; and the third, with the expulsion of the placenta. We might with some show of reason add a fourth stage, considering that to end with the complete closure of the uterine vessels, and the stoppage of every chance of hæmorrhage: but as this last might continue throughout the whole puerperal month, or longer, it may be as well to follow the more ordinary usage, and to regard labour as terminated on the removal of the placenta.

FIRST STAGE—DILATATION OF THE OS UTERI.—The first stage,—that which depends upon the dilatation of the os uteri from its perfectly close state to that of its full diameter, is generally the longest, the most uncertain in time, and the most tedious both to the attendant and the patient. This stage varies exceedingly in every feature, as indeed do all the others. There is a great difference observable in different women, and in the same woman at different labours, in the state of the os uteri soon after the commencement of the process. In some it will be found soft, lax, and yielding,—though not dilated, still dilatable; while in others it is hard, firm, rigid, and unyielding,—not allowing itself to be distended at all by the finger any more than a piece of hard leather would. There are four chief varieties of the os uteri, during the first stage of labour, as to its character. The first is when it is thick, soft, moist, cool, sensible to the touch — but not painfully so, — having very much the feel of a piece of thick, wet, chamois leather. The second variety is when it is thick, hard, and rigid; perhaps also hot, dry, and tender, and gives a sensation to the finger very much like the touch of a piece of cartilage. Under the third variety, the os uteri is thin, soft, moist, cool, and not painful, its edge feeling like a piece of moist brown-paper; and so thin, that through the substance of the cervix the head of the child can be pretty distinctly felt. The fourth is when it is thin also, but hard and rigid, tender or not according to circumstances, having a glazed feel, with its edge surrounding the presenting part of the child, and tightly embracing it, like a piece of whipcord. Under one or other of these varieties we shall always be able to arrange each state of the os uteri soon after the commencement of labour. It may be regarded as most likely to dilate kindly, when it gives to the finger the sensation of touching something soft and thick, like a piece of wet chamois leather, and is, as it were, chinked. Certainly either of the two soft states affords a better indication of a disposition to dilate, than those which are rigid; and it may be also deemed least inclined to relax, when it is thin and hard, and when the head comes down into the pelvis completely covered with the cervix uteri,—the circular edge resembling whipcord, or wire.

Varieties in the time occupied in dilatation.—As there is almost every variety in the state of the os uteri at the commencement of labour, so also there is great diversity in the time occupied in its opening; sometimes two or three hours only, at others the same number of days, are consumed in the progress of the first stage; and the os uteri of the same woman will differ much in this respect in her different labours.

Variations in the height of the Os Uteri.—We also find the os uteri varying exceedingly in situation at the commencement of labour; it is sometimes so high, that we can scarcely feel it when the finger is introduced, as in a common examination; and at others it is so low, that it is met with just within the vagina, and the presentation may be detected through the cervix. A more speedy termination may be expected, *cæteris paribus*, when the head has descended somewhat into the cavity of the pelvis, than when the os uteri is felt nearly at the brim; unless, indeed, the cervix should possess the thin, glazed, hard condition that I have just described; when we are to anticipate a lingering labour. It is generally to be found about two inches from the vulva, looking back, towards the upper joint of the coccyx; and it is readily discovered by the fore-finger of the right hand, or, at any rate, by the two first fingers of the left hand, introduced into the vagina.

Relative progress of dilatation.—Again, we observe that the first part of the dilating process usually goes on more slowly than the after part. Thus, the acquisition of a diameter to the extent of a shilling—sufficiently large to admit the tips of two fingers—will perhaps take up a longer period of time than its dilatation from that small size to the full and entire dimension, which easily allows the head of the child to pass through it. This partly arises from the natural disposition in the os uteri to open more readily after it has acquired a certain diameter; but it is partly owing also in some degree to mechanical action; for when the organ has become expanded to such an extent as to admit the membranous bag, or any portion of the child's head to occupy its aperture, the protruded part acts like a wedge, and forcibly distends it. The dilatation, however, is not attributable entirely to mechanical causes, for it depends in a great measure on the principle of vitality.

Generally speaking, the os uteri dilates with more pain and difficulty, and a longer time is consumed in the process, during first labours than subsequently. This is by no means, indeed, universally the case; although it is a common observation, that when women have had a number of children, the dilatation proceeds with comparative ease. Denman attempts to account for this facility in the following sentence:—"We may presume that a part which is accustomed to perform an office, or undergo a change, acquires a readier disposition to the office or change, according to the number of times it has performed that office, or undergone that change."*

It is quite impossible that we can give even a probable guess as to the time which any particular os uteri will require for the perfection of its dilatation; for sometimes one that has been from the commencement of the labour highly rigid, scarcely showing the least disposition to open, will suddenly become relaxed, and rapidly distend its circle to its full dimensions; while at another, though the part is soft and flaccid, the pains will altogether subside without any apparent cause; the process of dilatation will be suspended, and the labour will remain stationary for hours, without in the least progressing.

The pain experienced during the first stage, although not so intense or acute as in the second, is still more difficult to bear; and is also borne generally with less fortitude. It is, as I stated before, of a different kind from the pains of expulsion; it is a feeling as if some inward part were being torn or rent asunder. Perhaps it is not altogether in consequence of the peculiar sensations experienced, that the patient does not endure these early pains with so much resignation as those of a more expulsive character; but also from the knowledge which she has gained, either by a previous labour, or in conversation with her friends, that so long as the "grinding" pains continue, there is no chance of a speedy release; but that, as soon as the "forcing" pains come on, the labour may quickly be brought to a close; and *every next*, she thinks, may terminate her sufferings. As soon as the pains become changed in their character, hope is infused, fresh spirits are instilled, and thus the patient's powers are sustained.

If the labour be progressing regularly, the pain subsides and again returns; thus intermissions alternate with paroxysms of suffering; and if the woman be in other respects well, and in good spirits, she will often fall into a doze, and obtain a refreshing slumber during the intervals of uterine action; each pain, when it returns, awakening her from the delicious state of oblivion and repose, to a fearful consciousness of the trials she has to undergo.

Rupture of the Membranes.—With each pain the membranes are more or less protruded through the os uteri, so that they become tense, and the circle of the dilated mouth is drawn tightly around them. (Plate 33 shows the membranous cyst passing the mouth of the womb, and occupying a portion of the vagina.) In the interval of pain, when the uterus exerts no pressure from above, the membranes retreat, become flaccid, and are scarcely to be felt; and as there is little or no water then intervening

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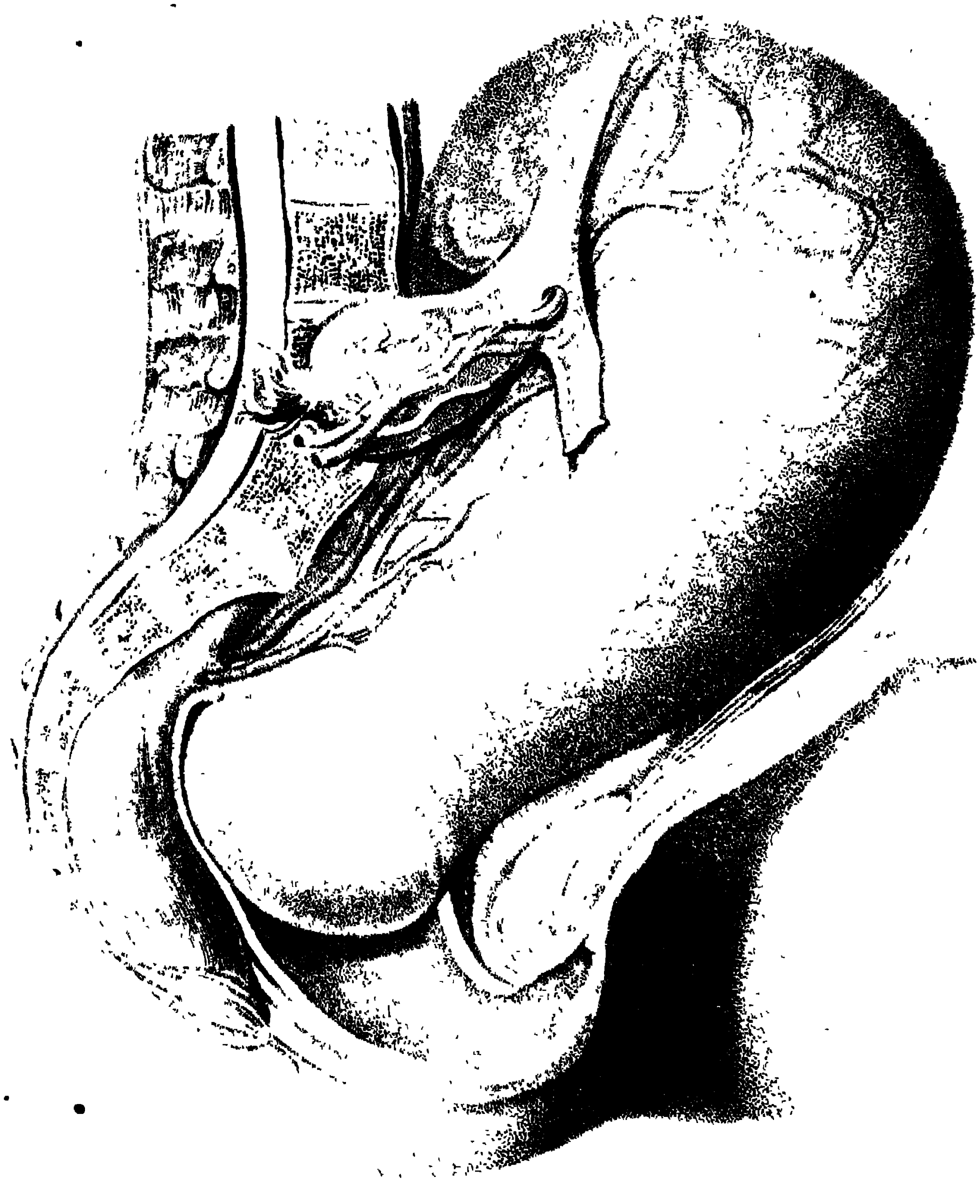
* Introd. to Mid., chap. ix. sec. 6.



between the finger and the person of the child, its presenting part can usually be distinctly discerned. Such a state of alternate protrusion and retrocession of a part of the membranous cyst continues an uncertain time; when under one of these painful contractions the membranes will burst, the liquor amnii will be evacuated, and the head of the child will come to bear, with each paroxysm, against the internal surface of the os and cervix uteri. On the breaking of the membranes, the first stage of labour has terminated.

Variations in the period when the Membranes rupture.—I have thus described the progress of a labour prior to the rupture of the membranes, taking it for granted that the liquor amnii will not be evacuated until the os uteri is dilated to nearly its full extent; but these two occurrences,—the full dilatation of the os uteri and the rupture of the membranous cyst,—are not always found in practice to correspond with regard to time: for sometimes the membranes break before the aperture is dilated even to the size of a shilling; while at others they protrude considerably through that organ before they rupture; the head of the child having descended so low as to occupy a great part of the cavity of the pelvis, and the os uteri having been widely open for some considerable time. Generally, when the membranes burst, the mouth of the womb has become dilated to a size sufficient to admit the hand; and we may presume that where such a degree of dilatation exists, the next two or three pains will expel the head entirely through its orifice.

According as the membranes are more or less rigid, and the mouth of the womb more or less yielding, will be the time occupied before the discharge of the waters. When the os uteri is soft, and the membranous bag tough, it will probably be long before this evacuation takes place; but when it is rigid, or the membranes are thin and tender, they usually break early. The period at which the membranes rupture, therefore, will not only depend upon their own toughness or tenuity, but it will also be regulated by the pressure which the edge of the os uteri exerts on them while they are protruded through it. The more lax is the os uteri, the less is the compression on the extruded portion of the cyst, because the orifice then distends to the power operating from within: but if it be rigid, the pressure is great; for then the inner margin closely and strongly embraces the tense membranes all around, producing by its very resistance a deep circular groove; and thus disposing the bag to premature laceration.

It is desirable in practice to preserve the membranous bag entire as long as possible; or, at least, until it has performed the whole office assigned to it by nature,—namely, the dilatation of the os uteri, the vagina, and somewhat of the external parts.

Whenever the membranes appear externally to the vulva, indeed, we may suppose that they have then effected all the good that can be expected from them; that their remaining entire may very likely be retarding the labour; and we may, in that case, venture to rupture them, provided the head present. But it is one of the first axioms to be learned in obstetric practice, not officiously or unnecessarily to destroy the cyst, so long as any advantage can be gained from its dilating powers.

SECOND STAGE.—PASSAGE OF THE FŒTUS THROUGH THE PELVIS. —From the foregoing remarks it may be gathered that, after an uncertain time, the os uteri becomes fully dilated; the membranes burst; the liquor amnii is evacuated, generally in a full stream; and the second stage of labour commences.

Modes in which the Vertex presents.—The passage of the head through the brim of the pelvis forms the first part of the second stage. It is most likely, indeed, that the head will have descended considerably into the cavity before the waters flow away; but it is also possible that it may scarcely have engaged itself even in the brim when this crisis in the process occurs. It has been already shown, that of all the points of the head, the vertex most commonly presents; or rather the superior, posterior portion of the parietal bone near to the vertex; and it has also been proved that this is a most wise and beneficent provision of nature, because in that position the fœtal skull will pass through an aperture of less dimensions than in any other. The vertex then depending, there are eight different directions in which the head may be placed, requiring our consideration, in a view to practical utility. The first is with the face inclining to the right ilium; the right ear being behind the symphysis pubis; the left ear towards the spinal column; and the occiput inclined to the left ilium.* (Plate 34, fig. 1.) The second is the reverse of this position: the face inclines to the left ilium; the occiput to the right ilium; the right ear lies towards the promontory of the sacrum; the left ear behind the symphysis pubis. (Plate 34, fig. 2.) The third mode is, when the head is placed diagonally, the face looking to the right sacro-iliac synchondrosis; the right ear to the right groin; the left ear to the left sacro-iliac synchondrosis; and the occiput behind the left groin. (Plate 35, fig. 1.) The fourth position is the reverse of this, again, where the face is placed against the left sacro-iliac synchondrosis; the occiput behind the right groin; the right ear against the right sacro-iliac synchondrosis; and the left ear behind the left groin. (Plate 35, fig. 2.) The fifth position is where the face is looking towards the right groin; the occiput to the left sacro-iliac synchondrosis; the right ear to the left groin;

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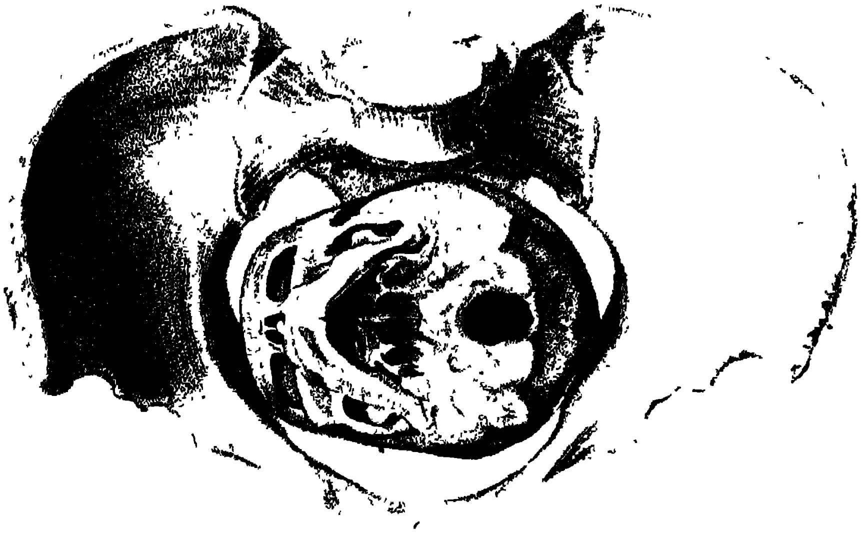
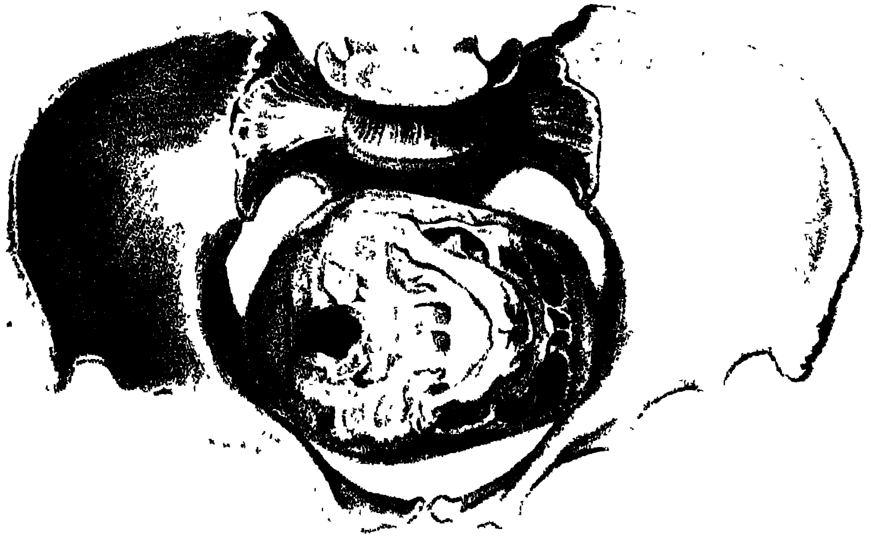
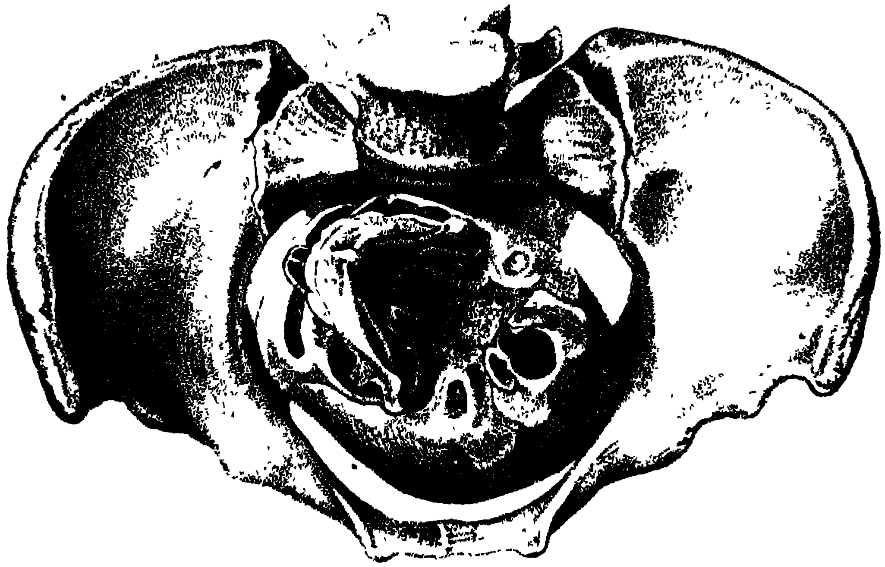
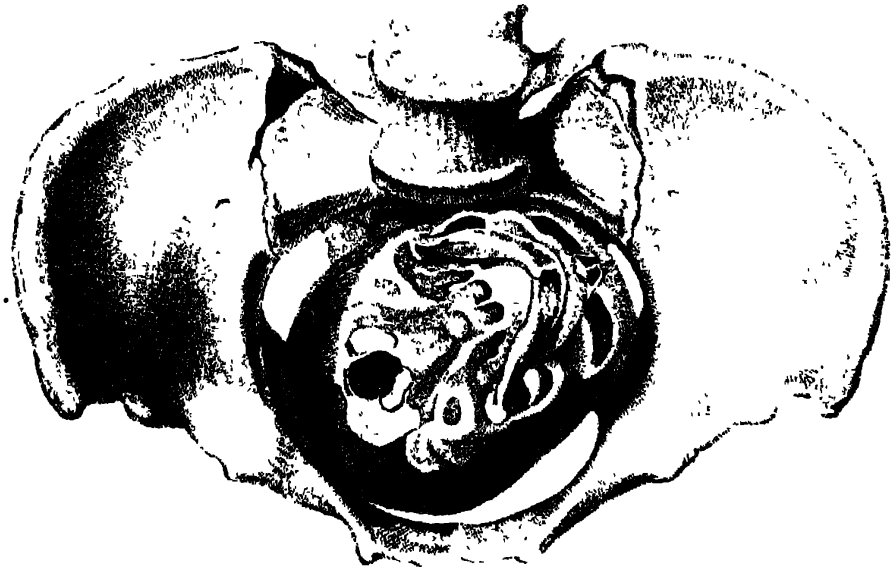
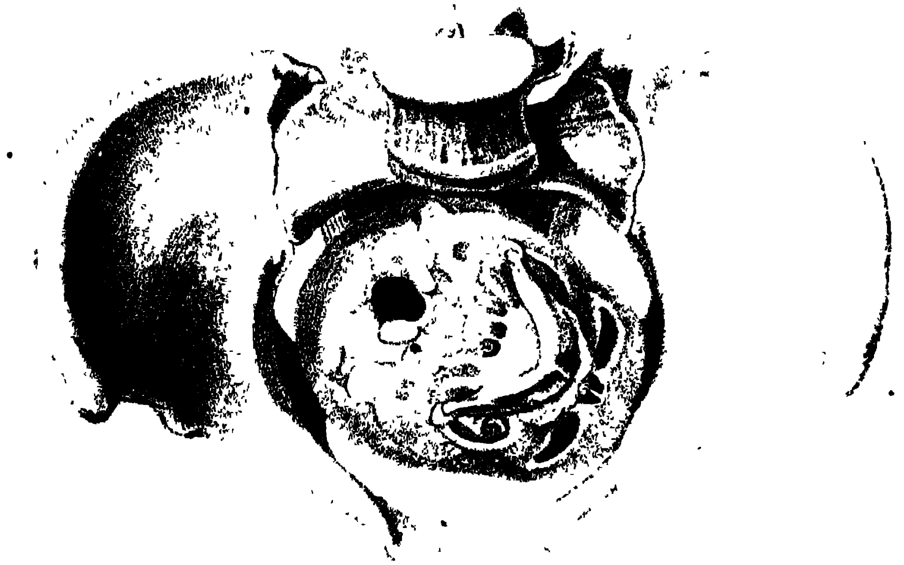
* It must be understood by the student that these are not placed according to the frequency of their occurrence; but merely for convenience of description.

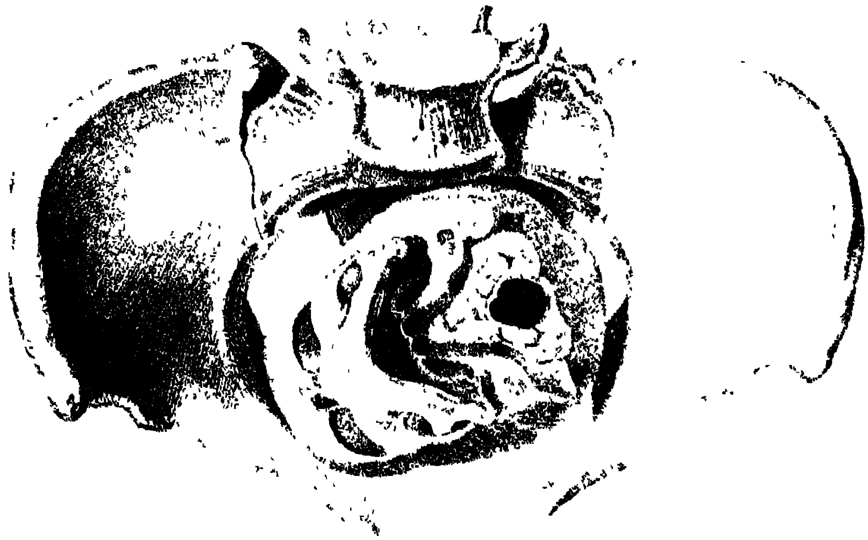


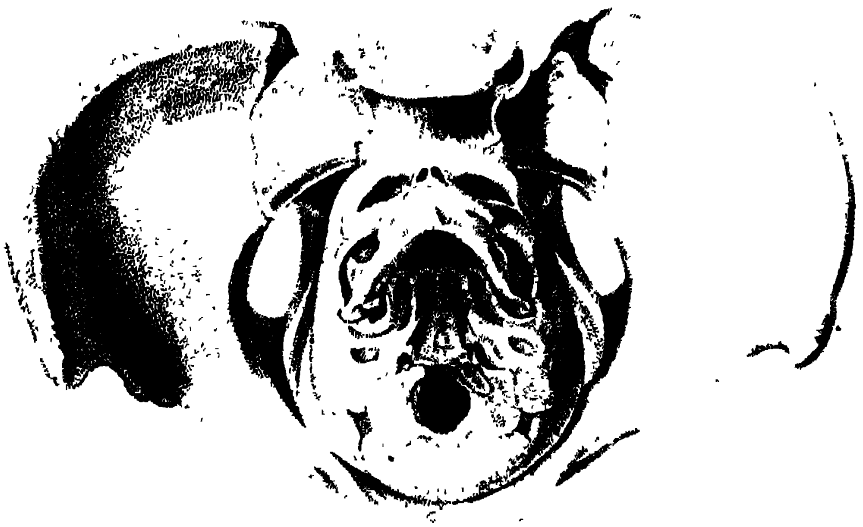


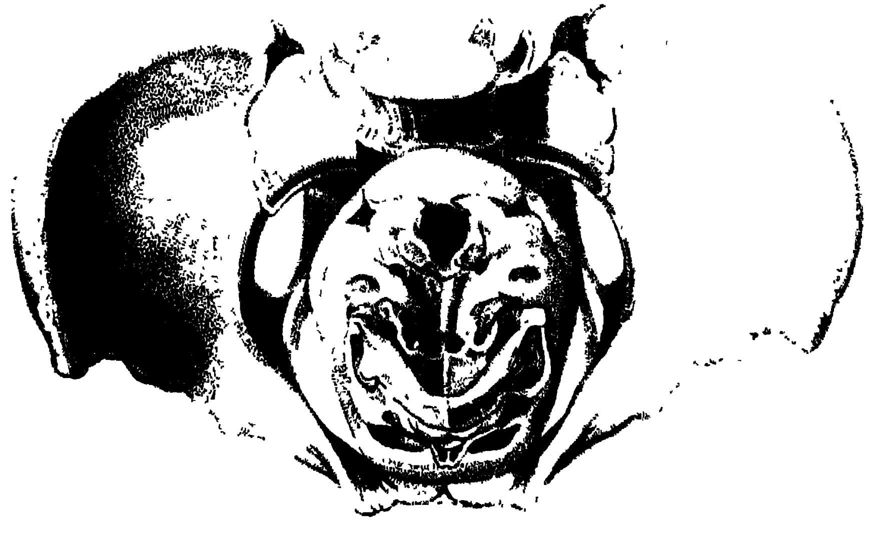












and the left ear to the right sacro-iliac synchondrosis. (Plate 36, fig. 1.) The sixth position is where this is reversed, the face looking towards the left groin; the occiput to the right sacro-iliac synchondrosis; the right ear to the left sacro-iliac synchondrosis; and the left ear to the right groin. (Plate 36, fig. 2.) The seventh is where the head attempts the passage with the forehead immediately against the promontory of the sacrum; the right ear to the right ilium: the left ear to the left ilium; and the occiput behind the symphysis pubis. (Plate 37, fig. 1.) And the eighth, where this position is reversed, the occiput being exactly against the promontory of the sacrum; the forehead impinging on the symphysis pubis; the right ear to the left ilium; the left ear to the right ilium. (Plate 37, fig. 2.)*

Comparative frequency of the various modes of Vertex Presentation.—Of these presentations, the first four have usually been described as the most frequent; that is, when the face either looks directly to one ilium or the opposite;† or diagonally to one sacro-iliac synchondrosis or to the other; and the diagonal direction has been regarded as more common than the other two. Under either of these positions, the natural inclination of the head is to descend into the pelvic cavity in the same direction in which it cleared the brim, until it fully occupies the pelvis, and then to turn with the face into the hollow of the sacrum, and the occiput under the arch of the pubes, the face being expelled, sweeping the perineum. When such is the original situation of the head, it is believed that the labour is more easily accomplished than under any other. It is believed that the face is more commonly inclined towards the right sacro-iliac synchondrosis than the left; and this accords with my own observation.

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* These plates are copied from Moreau's folio work entitled "Traité pratique des Accouchemens," who, like myself, gives eight positions of the fœtal head under vertex presentation.

† For many years after I began practice, owing to peculiar circumstances, I had a great deal more to do with operative than with natural cases of labour; and when called upon to deliver by the forceps, I found in so many instances the face looking directly to one or other ilium, most frequently the left, with the left ear behind the pubes, that I considered that position of the head in reference to the pelvic cavity by far the most frequent of any. Subsequent observation and experience, however, have convinced me that I was in error. It is true that at the time when the instruments were applied, the long diameter of the head was situated in the direct transverse diameter of the pelvis, with the face exactly opposite to the iliac fossa; but I am now persuaded that in most of these cases the face was originally placed behind the obturator foramen of that side—that is, diagonally forwards; that nature had attempted to turn it backwards into the hollow of the sacrum; that this change had only been partially effected, the head being arrested *in transitu*. This will account for my having described the two first of my eight varieties of vertex presentation as common positions, while many practical men, as Baudelocque, omit them altogether. Nevertheless, I am persuaded that the head does so present sometimes at the onset of labour, influenced perhaps by some peculiar formation of the pelvic brim.

Of the next four presentations, the fifth and sixth are the most frequent, viz., where the face is looking diagonally to one or other groin, and the occiput to one or other sacro-iliac synchondrosis. It is supposed that these are not very frequent cases; and that the head is seldom so speedily expelled as in either of the first four. In these situations, we should imagine that the natural inclination of the head would be to pass down obliquely till it comes to the outlet of the pelvis, and then to turn with the face under the arch of the pubes and the occiput into the hollow of the sacrum. Much more room is required for the exit of the skull with the face forwards, than when it is thrown back into the sacral curve; because its general figure is then not so well adapted to the pelvic cavity; but especially because the expanded brow does not so easily insinuate itself between the rami of the pubic arch as the more conical vertex does. For this reason the occiput is pressed more powerfully backwards before expulsion takes place, the coccyx is put more upon the stretch, and the perineum is also more extended.

Yet, although the natural inclination of the face, as we should *à priori* think, would be to appear under the pubes in its exit when it was originally directed to either groin, it is, nevertheless, much more common for the head, in its passage through the pelvis, to turn with the face into the sacral cavity, and to be expelled in the same manner as though the face had from the commencement been inclined laterally or diagonally backwards.

The seventh and eighth cases of vertex presentations—where the face attempts the passage, being placed directly against the promontory of the sacrum or above the symphysis pubis—are the most infrequent of all the eight; they are so rare, that some practitioners of considerable experience tell us they never met with them. Naegele* and other German, with some French, authors deny the existence of such a case; and Campbell† doubts the possibility of its occurrence.

As in the early part of this work it was demonstrated that the fœtal cranium, from occiput to forehead, measures four inches and a half, while the sacro-pubal diameter of the standard pelvis at the brim possesses only four inches of clear available space; it is evident that, although the head might present in the seventh or eighth position, it cannot enter the pelvis in either of those directions. Before, then, it can engage in the superior strait, it is compelled to turn, with the face somewhat towards the right or the left side. I have certainly never been called upon to deliver by instruments when the head occupied either of the unfortunate situations now under discussion; but I have known them to obtain at the commencement of labour; and I have traced the head make a turn with the face to one or other side, being forced into that position by the strength of the uterine contractions, in an analogous manner to the turn effected in all natural labours, when it is on the point of being expelled through the outlet. I think, therefore, the assertion, that such a presentation never occurs, or is impossible, far too general and sweeping; and a case detailed by Dr. Radford,* where the head presented with the face above the sacral promontory; and another by my father, where, in a second child of twins, the forehead offered itself above the pubes, and the labour was terminated instrumentally, prove that my opinion is correct.†

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* Essay on the Mechanism of Parturition. By Rigby; preface, p. 16.

† Introduction to Midwifery, p. 244.

Phenomena observed during the second Stage.—When the mouth of the womb is entirely dilated—whether that occurrence have taken place previously to, or after the rupture of the membranes —it becomes, as it were, obliterated, the vaginal and uterine cavities form one continuous canal, and the division between them is not easily discernible until after the child's expulsion. The discharge of the liquor amnii is usually followed by a respite from pain, of rather longer duration than had been experienced for some time before; but when the uterine contractions return, they are mostly increased, both in length and strength; they are more forcing, and are attended with bearing-down efforts of greater or less violence. Under these expulsive throes, the pulse, which was quicker than ordinary during the first stage, becomes even more accelerated; there is increased heat of skin, and soon a copious perspiration breaks out; the mouth often becomes parched; the breath is held in; and those voluntary muscles whose action assists the uterus are called powerfully into requisition, to aid the uterine energies. The patient tightly grasps whatever can give her steadiness and support, places her feet against some unyielding point, suspends her respiration, and strains with all her might. Although the pains during the progress of the second stage are stronger than in the first, still the intermissions are more decided, and the intervals of ease more perfect: they are endured with more composure and fortitude; and the woman usually slumbers between each paroxysm, even although she had been unable to sleep earlier in the process, in consequence of her irritability or anxiety. This inclination to doze should be indulged, as it keeps the mind in a quiet and calm state, refreshes the spirits, and restores the bodily powers. At other times, from the moment the liquor amnii is evacuated, the efforts of the uterus become redoubled, as though some fresh excitement was applied; and this may probably arise from the os uteri being irritated more by the bony head than by the soft cushion previously interposed between itself and the presenting part.

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* Essays on Midwifery,—No. 2. Also in Lond. Med. and Surg. Journal, vol. iv. p. 783.

† Practical Observations in Midwifery, second edition, p. 371; the 191st case of the former editions.

After the escape of the liquor amnii, the fœtal body is more or less compressed, in proportion to the uterine exertions, and the resistance offered by the passages. It is therefore folded into lesser space, and the chin is directed more forcibly against the chest, so that the neck is bent more into a curve, and the whole form more into a compact oval.

Progression and recession of the Head.—I have before mentioned, that the membranous bag, while entire, is tense, and protruded during each pain; that it becomes lax, and the water recedes, when the pain goes off. The same thing also happens with regard to the head, so far as protrusion and retrocession are concerned. After the membranes are broken, it is forced a little downwards with each contraction; and in the absence of pain retreats, sometimes considerably. This is particularly remarkable when it is passing through the outlet of the pelvis. At that period of the labour the vertex may be expelled so far outwardly that the anterior fontanelle is brought even to the edge of the perineum, during the urgency of a pain; yet when remission occurs, the head will recede, and be again perfectly buried within the genital fissure, so that the labia close around it. To such an extent is this recession sometimes carried, that it may give those not well acquainted with the process an idea that the uterus has ruptured, and that the child's body has partly passed into the abdominal cavity. And here, again, we cannot help remarking the beauty of nature's ordinances: it is impossible, indeed, to contemplate a single provision, even of the minutest character, adapted to the exigencies of gestation and labour, without being fervidly and awfully impressed with the extent of that Wisdom, Power, and Beneficence, which established the laws, and controls their operations.

The advantage of this retrocession consists in the removal, for a time, of that distending pressure which obtains when the head is propelled downwards. If there existed a constant urging forward, without the least relief to the parts, throughout the whole progress of the labour,—even under the most common natural case, in which not more than the usual time was consumed,—the soft structures must suffer very considerable injury; the vessels must be more or less strangulated; the circulation would be suspended or impeded; inflammation would almost be a necessary consequence; and gangrene would generally follow. We are, therefore, to hail this recession of the head in its progress through the pelvis as a fortunate occurrence for the woman; since it relieves her from present pain and future danger. It is also to be regarded as a good sign, inasmuch as it proves that the cavity of the pelvis is tolerably capacious.

When the head has entered so low into the pelvis that the forehead and occiput impinge respectively on the internal surface of the tuberosities of each ischium,—inasmuch as the long diameter of the head, while in this situation, is opposed to the short diameter of the pelvic outlet, and exceeds that diameter by half an inch, it is impossible for it to escape in that direction. A change is consequently effected: the face is thrown into the hollow of the sacrum, and the occiput under the arch of the pubes. This alteration in position, however, does not commence until the head is fully lodged within the pelvic cavity.*

Compression of the Head.—We also remark—especially in first labours, or any case where there is much resistance—that the head, from pressure, assumes somewhat of a conical figure, the bones of the cranium overlapping each other, so as to diminish the lateral diameter. In consequence of this decrease in volume, the scalp becomes corrugated,—puckered near the vertex into three or four folds, very evident to the touch, and observable, *cæteris paribus*. in the same degree as the head is compressed. Pressure to such an extent is seldom injurious. After a time, however, when the head has remained long within the pelvis, and especially if it be impacted, this corrugated feeling of the scalp disappears; and instead of it, a soft puffy tumour is observed in the same situation.

While the head thus continues in the pelvis, both before and after its turn is effected,—being compressed by the pelvic bones, and reciprocally exerting equivalent pressure on the soft structures within the cavity,—another most distressing symptom often arises, bringing with it great increase of suffering, but not generally interfering with uterine action, or retarding the progress of the labour;—I allude to cramp, of the most violent character, affecting the calf and sole of the foot. This is consequent on the compression to which the great sciatic nerve is exposed at this stage of the process; and is so painful that the patient can scarcely restrain her screams.

Exit of the Head.—The vertex, then, of all the cranial surface, first appears externally, and as it descends lower and lower, the labia become opened; the anus dilated; the perineum distended, heated, and very much thinned; so that it feels almost like wet vellum.† In this way, retreating when the pain goes off, and advancing when it returns, the face sweeps along the sacrum, coccyx, and perineum; the chin slowly recedes from the chest; the occiput turns up under the arch of the pubes; the perineum slips back over the face as it is extruded; and the head is by degrees expelled. On its entire expulsion the face is directed towards one or other thigh. (Plate 41.)

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* Plate 38 shows the head occupying the pelvic cavity, the face being directed to the right side.

† In plate 40, copied from Smellie, the child's head *a*, is seen separating the labia; the extension, thinning, and protrusion of the perineum *b*, caused by the head's

During the passage of the head externally, the pains are even more forcing than have yet been experienced: the woman bears down more strongly, makes a greater effort, and calls forth the utmost power of the abdominal muscles and diaphragm, to aid the uterine contractions. It appears as if all the vital energies were directed towards the accomplishment of the object nature has in view: most of the muscles of the body participate in the general struggle; a violent trembling, which it is impossible to control, frequently pervades the whole frame; and at the moment the head emerges, a piercing shriek will mostly escape the patient, as though involuntarily. When the head is on the point of passing, the contents of the rectum are usually squeezed out; and on its entire protrusion, the perineum, from its own elasticity, recovers its former size and appearance; it is collected round the neck of the child,—the woman is completely relieved from the distending force, and consequently from the agony she endured. She will now generally express some strong sentiment of gratitude and joy: or perhaps her feelings will only find utterance in tears.

Under all states of the system, the sudden removal of intense pain brings with it a sensation of positive pleasure; and in no case is the instantaneous transition from extreme misery to actual joy more conspicuous than immediately on the delivery of the head; and this especially if it be a primary labour; to which, indeed, the preceding remarks are more particularly applicable. A longer interval of ease will probably follow the expulsion of the cranium than had occurred since the perineum first began to be extended. In a very few minutes, however, action is again established, for the purpose of completing the delivery.

Exit of the Body of the Child.—After the head has effected its turn, with the face into the hollow of the sacrum, and is passing through the outlet of the pelvis, with its long diameter in the same direction as the long diameter of the inferior aperture,—namely, from the fore to the back part,—the shoulders are at the same moment entering the cavity, and passing through the brim,

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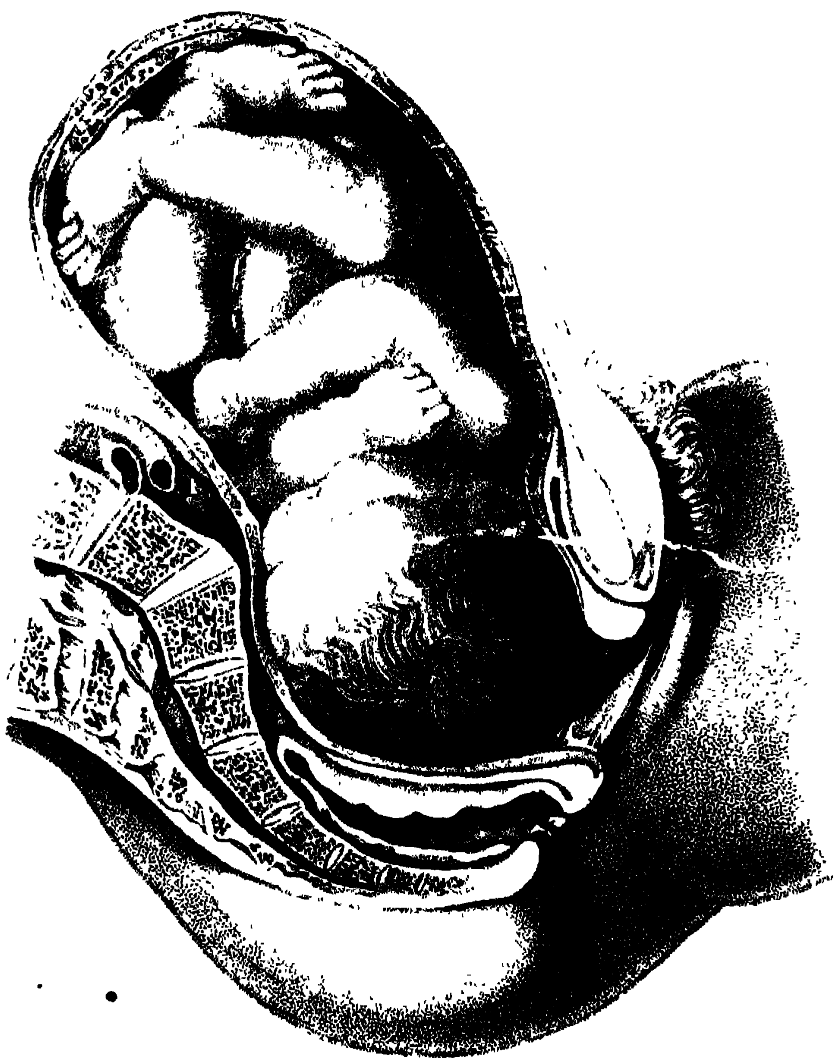
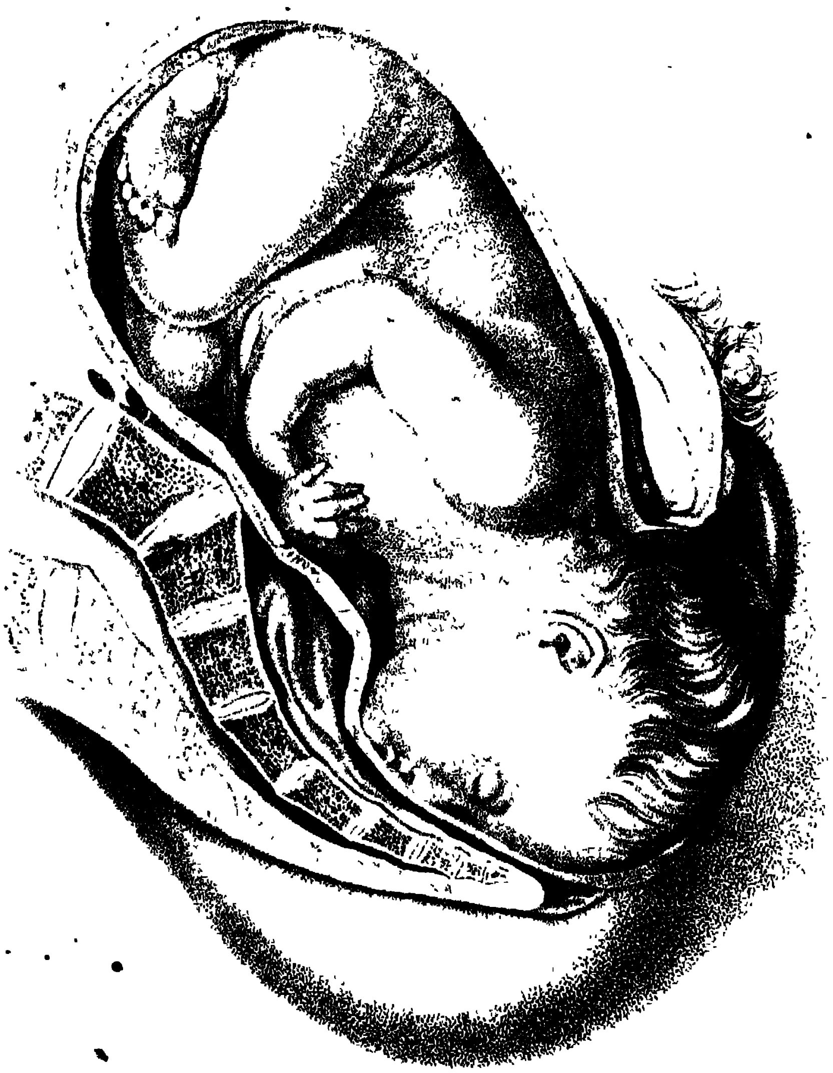
descent, and called by some *the perineal tumor*, are also well portrayed; *d* marks the point of the coccyx; *e* the anus dilated, so that the inner membrane of the rectum is to some extent exposed to the contact of the hand, when applied for the protection of the structures. This exposure is not injurious; no harm arises from it; and sometimes it is even greater than is represented here





with their long diameter in the same direction as one of the long diameters of the superior aperture, which is diagonally from side to side; so that the child is here adapted, both as it regards its head and its shoulders, to the pelvis, in such a way as to make its transit the most easily.* After the head is born, however, when the shoulders have come down to press upon the outlet of the pelvis, their long diameter is opposed to the short diameter of the outlet, and they seldom can make their exit in this situation, unless the child be small or ill-formed: but most usually they also effect a turn similar to the turn already described as being made by the head; one of them being directed into the cavity of the sacrum, and the other insinuating itself under the arch of the pubes. Through the inferior aperture of the pelvis, then, the child is expelled sideways, one shoulder and arm distending the perineum, and the other offering itself anteriorly. (Plate 41.) One pain may be sufficient to effect this turn and expel the shoulders; or two or three may be required.

When the fœtal body is so far protruded that the parts are again distended by the shoulders, the patient experiences a return of pain; not such violent agony, certainly, as when the head was being expelled, but the same feeling of forcible distension,—the same sensation as if the parts were being rent. A short time only elapses before the uterus resumes its action, to expel the breech; the child in the interval remaining half born, the perineum somewhat on the stretch. As the breech takes up less room than either the head or shoulders, it is usually extruded with slight exertion; the legs and feet either pass directly, or remain a minute or two in the vagina, and are ultimately expelled by the vaginal fibres: the birth of the child is then perfected, and the second stage of the labour brought to a close.

The time occupied by the passage of the child, after the rupture of the membranes, is as uncertain as the period required for the dilatation of the os uteri and the accomplishment of the first stage. Sometimes the same pain under which the membranes burst, expels the head, and perhaps the body also; at others very many hours of wearying suffering are sustained before the head emerges; and the same uncertainty with regard to time applies —but in a very limited degree—to the passage of the shoulders, subsequently to the birth of the head; sometimes scarce a moment intervenes, sometimes a considerable space; usually, however, the child is entirely expelled within five minutes after the head has passed.

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* Plate 39 represents the face traversing the sacral cavity, after the head has made its turn. The shoulders are seen passing through the brim, with the left directed towards the right groin, and the right opposite to the left sacro-iliac symphysis; the original presentation of the head having been the vertex with the face to the right sacro iliac junction. In most of the plates which describe this position of the fœtal head, the body is also turned quite round, with the abdomen looking directly towards the mother's spine. From repeated observation, I am persuaded that this is not correct; that the body still in utero is not turned in the same proportion as is the head; and that the cervical, dorsal, and lumbar vertebræ are somewhat twisted: so that the breech and lower part of the trunk retain their original situation in regard to the mother's body, although the head has been so materially altered in respect to that which it occupied. This is proved by the child's face being directed to one of the woman's thighs immediately on its expulsion.

The symptoms of a speedy termination to the labour are, that from the beginning we should find the os uteri lax, soft, thick, moist, cool, and not tender; that we should find the vagina also soft, moist, relaxed, and cool, and the perineum easily distensible; the pelvis well formed; the head directed with the face laterally, or looking diagonally backwards, with the vertex downwards. With such indications, if the woman be in good health, and the pains pretty active, we may expect a speedy termination to the case.

The symptoms foreboding a tedious labour are exactly the contrary to those I have just mentioned:—that we should find the os uteri thin, hard, unyielding, dry, and tender, and feeling round the presenting part of the head as if a cord were tightly encircling it; that the vagina and perineum should be dry, hot, narrow, and constricted; that the head should be wrongly placed; the pelvis small; or the uterine action feeble: any of these features displaying themselves will indicate the probability of a protracted struggle.

Usually, when the os uteri has been preternaturally rigid, the soft structures towards the outlet of the pelvis are also indisposed to yield, and the labour is therefore tedious from the commencement to the close: but this is by no means always so; for sometimes these parts will give way very easily after the os uteri has opened with great difficulty; and in other cases they will be very rigid, when the os uteri has dilated tolerably easily. It may be looked upon as a general rule, that the vagina and perineum are least disposed to dilate in first labours; and this observation is more universally applicable to them than to the mouth of the womb. We very seldom, indeed, find either of these organs more rigid in subsequent labours than in the first, unless that rigidity be the consequence of a cicatrix produced by sloughing. It is possible that after a difficult labour, inflammation of the vagina may occur, which may terminate in slough; the slough will separate, the ulcer will heal, a puckering will take place, and a cicatrix will be left; by which processes the capacity of the canal is much diminished, and its dilatability impaired: but this is an accidental occurrence, and must be reserved for future consideration.

Third Stage.—The second stage being terminated on the birth of the child, the third consists in a continuation of the same efforts for the expulsion of the placenta.

Varieties in the time occupied in the expulsion of the Placenta.—This stage also varies much in respect to time; if the uterus be vigorous and active, the placenta is generally expelled quickly; but if uterine action has been feeble during the former parts of the process (particularly if the labour has been lingering, or the child has been extracted by mechanical means), a comparatively long period usually elapses before it passes. In some instances, indeed, the uterus does not act to expel it at all, and the introduction of the hand is required for its removal. I have sometimes known the placenta thrown out of the vagina by the same pain that expelled the child; more frequently ten, fifteen, or twenty minutes elapse before it escapes wholly from the uterus into the vagina, and even then it may lie in that cavity for hours before it clears the os externum. Those contractions by which the expulsion of the placenta from the uterus is effected, are also attended with suffering; not, indeed, nearly approaching the violence of the pains under which the fœtus was born, but more like the uneasy sensations experienced during the commencement of the first stage: they are referred principally to the loins and upper region of the sacrum, and are scarcely complained of. It is seldom that a single pain expels it even out of the uterine cavity; more frequently three or four follow each other, at tolerably regular intervals; and it descends into the vagina by degrees.

When it has passed from the uterus—if the case be left entirely to the natural powers—the muscular fibres of the vagina complete its extrusion; but as this canal has suffered severe and unusual distension during the birth of the child, we cannot expect that the muscular coat will regain its previous tone in an instant, so completely as to embrace the mass firmly, and expel it immediately. It consequently remains within the vagina, until the fibres have recovered sufficiently to act upon it. This requires a very different period in different instances; sometimes five or six hours will elapse; most usually it is protruded within the hour.

Separation of the Placenta from its Uterine Attachment.—Previously, however, to the placenta being expelled out of the uterine cavity, it must be separated from its uterine attachment. This separation is produced exactly by the same action which causes its extrusion,—uterine contraction. After the birth of the infant, the general volume of the uterus and the capacity of its cavity being diminished in proportion to the degree of contraction it has undergone, it necessarily follows that the uterine surface, before occupied by the placenta, is proportionably decreased, and shrinks into a less space.

As the placenta is a perfectly passive body—as there is no power inherent within its own structure, by which its maternal face can be diminished in any degree corresponding with the diminution of the internal surface of the uterus—the very shrinking of the uterine parietes occasions it to lose its former hold; it spontaneously falls from its attachment, and would remain loose in the uterine cavity, unless extruded by a continuance of uterine action. This simple contraction, then, causing the uterine membrane to slip away from the placental surface, both separates it from its connexion and expels it from its cavity. The placenta passes through the vagina inverted, so that its fœtal face becomes external; the membranes attached to it are also turned inside outwards, and are flapped over its maternal surface. There is always a loss of more or less blood accompanying the separation of the placenta; and this blood appears externally upon the linen. The quantity varies to a great extent; sometimes it does not exceed an ounce or two; at others it amounts to many pints, constituting a most violent hæmorrhage.

Even after the placenta has been expelled from the uterine and vaginal cavities, the process of uterine contraction does not cease, but continues for the purpose of arresting the flow of blood by the closure of the vessels; for preventing the possibility of the womb being inverted; and for assisting in silently and gradually decreasing the bulk of the organ to its former small, unimpregnated state. Should the uterus not contract, in proportion to the flaccidity of its parietes, the distensibility of its cavity, and the perviousness of its vessels, would be the danger of hæmorrhage. It does not perhaps necessarily follow that dangerous flooding must occur, even although the contraction were imperfect; because it is possible that coagula might form at the open apertures of the uterine vessels which were previously closed by the apposition of the placenta; and if the heart's action were not powerful enough to dislodge those coagula, the loss of much blood might be by them prevented. But this kind of plug is a most inefficient security against all varieties of uterine hæmorrhage; and no woman can be considered safe from flooding until the uterus is firmly, entirely, and permanently contracted.

The restoration of the uterus to its original size, shape, and general appearance, the alteration in the character of its fibres, the diminution of its vessels, and the removal of the nerve matter previously deposited, are not less wonderful than its evolution and growth during pregnancy. In some respects, indeed, they are even more so, since the time occupied in its return to its unimpregnated state is so much shorter. The process is effected partly by the contraction of the fibres embedded in its tissue, but chiefly by the conversion and degradation, and afterwards by the absorption of its integral parts. The muscular fibres undergo the fatty degeneration, lose their distinctive characters, and are removed; all the other tissues simultaneously disappearing also; so that a universal destruction and decay take place. But, notwithstanding the ruin that is thus proceeding, there may be detected by the microscope a fresh series of spindle-shaped cells, which are to supersede the effete fibres, as they are absorbed, and are in their turn to become the tissue of a new uterus, remaining at a low stage of organization, until the stimulus of impregnation calls forth in them also the wonderful changes that had been exemplified in their predecessors.

Every one who has seen much of obstetric practice must have been struck with the fortitude and resignation with which women bear the agonizing throes of parturition, and the rapidity with which the system recovers from the lengthened suffering and regains its average balance. This must be regarded as one of Nature's greatest mercies; but there is this grand difference between the pain of labour and every other kind of pain—the latter is unnatural, and dependent on morbid actions, influencing for the time the condition of the organ affected; the former is natural, and inseparably connected with the performance of a healthy function.

DUTIES OF THE MEDICAL ATTENDANT UNDER NATURAL LABOUR.

From the knowledge which the foregoing pages will afford of the beneficence displayed by Nature throughout the processes of utero-gestation and labour, and of the admirable contrivances adopted by her to overcome difficulties and avert dangers, it will be evident that, in a very large proportion of cases, the duties of the obstetrician must be few and simple. Generally, indeed, no *active* assistance is necessary, until after the birth of the child; all that is required of the attendant being, that he should remain an observant, though unofficious, spectator of the process;—ready to exert himself with promptitude and energy, on the first accession of any alarming symptom; but equally, or more, ready to allow the changes necessary for the completion of Nature's object to proceed, uninterrupted by any meddlesome interference: for no maxim in obstetric science is of more universal application, than that unnecessary "assistance,"—rendered with the view of expediting the termination of the case, or shortening the sufferings of the patient,—is not only useless, but in the highest degree injurious, and directly calculated to defeat its own end.

Let it not be supposed this declaration includes the admission, that a *partial* acquaintance with the obstetric branch of medicine is sufficient for the safe practice of the profession; for although, in thirty-nine cases out of forty, little is required to be done beyond protecting the extended structures from injury, separating the child, and extracting the placenta from the vagina—after its total exclusion from the uterine cavity—still, in the fortieth, danger may occur, only to be arrested by the promptest, the most decisive, and most judiciously directed help.

Much knowledge is necessary to discriminate the kind of cases in which assistance is proper, and determine the time at which that assistance ought to be employed, as well as the mode of its application. It is this which distinguishes the scientific from the ignorant obstetrician;—it is this important knowledge on which the life, the future health and comfort, of many a parturient woman must depend; which, nevertheless, has been held in such low estimation by some members of the profession, as to be thought unworthy of cultivation by the scientific and literary mind; unfit to be possessed by men of respectable station in society; and the adaptation of which knowledge to practice was once characterised, in an official document under the seal of the highest of our medical corporate associations, as "an art foreign to the habits of gentlemen of enlarged academical education." *

No one can read this sentiment without feeling that it is both inconsiderate and unjust. To omit, indeed, any particular mention of the science and judgment requisite to treat such perilous accidents as hæmorrhage, in all its varieties, and convulsions, a most important question,—involving no less than the destruction of fœtal life,—is often painfully forced upon the attention of the obstetric practitioner. He is by no means very unfrequently called upon to decide whether the delivery can safely be trusted to the natural powers, or requires to be terminated by artificial aid; and if so, whether means may be used compatible with the child's safety, or the horrible alternative must be had recourse to, of sacrificing the infant to preserve the mother. Is it of no importance that this should be determined by an educated, intelligent, and *practical* man?—Is it right that questions of such vital interest should be left to the decision of one but *partially* qualified to answer it?—And can we suppose that any person can form a proper estimate of the powers with which nature is endowed, to surmount the impediments, and overcome the dangers, that occasionally embarrass parturition, unless he have the opportunity continually before him of watching her operations in the more ordinary cases?—For these, if for no other reasons, the interests of the public must be best protected when the obstetrical branch of medicine and surgery is undertaken, in common with the other duties appertaining to those sciences, by persons who have qualified themselves, by their medical studies, for the conduct of the most dangerous casualties, and who are entitled, by their rank in society, and their preliminary education, to the consideration of gentlemen.

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* Letter from the Royal College of Physicians to the Secretary of State for the Home Department, dated May 2nd, 1827, in reply to a Memorial from the Obstetric Society. In the same communication, it is asserted "that the most successful practice of midwifery requires no such laborious preliminary study," [as is necessary for the practice of medicine,] "else discreet matrons, and plain uneducated men in the country, who frequently arrive at great notoriety in this calling, would not acquire that credit which they often attain." Since that time, however, the College have virtually acknowledged that they had formed an erroneous estimate of the amount of information required for the successful practice of obstetric medicine; for, permitting their own prejudices to vanish before the increasing acquirements of the general profession, they have recently annulled their by-law, which placed the honours of the fellowship beyond the reach of obstetric practitioners.

It can scarcely be necessary that I should insist on the obligation we lie under, to obey every summons to an obstetric patient as speedily as possible: for, even although a former one may have been lingering, it by no means follows that the subsequent labours should be of the same nature; and a practitioner must subject himself to much annoyance and blame, if, through remissness or negligence on his part, he should find the case terminated on his arrival. It is always right—however little is required to be done—that the medical attendant should be present during the chief period of the process, that he may be at hand to employ such means as any emergency may render requisite.

A lancet and a female catheter are the only instruments with which the obstetrical practitioner need furnish his pocket-case; sufficient time will generally be afforded him for procuring any others he may want, even in the most urgent cases. He will find it convenient, however, especially in country practice, to carry with him two or three drachms of laudanum.

It is not often that we have the opportunity of choosing the apartment in which the woman shall pass the puerperal month, as she is usually delivered in her own bedroom; but if that advantage be given us, we should make choice of one that is spacious and airy, with a dressing-closet or ante-room attached to it, and at a convenient distance from the domestic offices.

Nor, perhaps, are we generally expected to regulate the number of individuals to be present; though we may at times be compelled to exercise our authority in this respect. Bearing in mind that the room should be kept as noiseless as possible, there are yet some attendants whose services we cannot dispense with. The only persons whom I would willingly admit are the nurse and some female married friend,—the mother, or other near relation, or an intimate acquaintance,—to act as *confidante* to the sufferer,—into whose sympathizing ear she may whisper all her apprehensions and distresses, and from whom she may receive those numberless comforts and sustaining consolations of which she stands so eminently in need. Unmarried females are neither the most fit companions for the patient, nor the most useful assistants to the practitioner. In addition, it is proper that a servant should be in attendance in the ante-room, or close at hand, that she may be ready to bring whatever may be wanted from a distant part of the house without delay; and she should have no duty imposed on her for the time being, except an obedience to the orders that may issue from her mistress's chamber.

On arriving at the patient's residence, it is better not abruptly to obtrude one's-self into her presence, unless there be some immediate necessity for our attendance. Information should be sought from the nurse, on such points as will enable us to judge whether labour has actually commenced. On being ushered into her chamber, we may engage her in some general conversation, which will give us an opportunity of observing the frequency, duration, strength, and character of the pains; and our conduct must be framed accordingly. Should they be of trifling importance, we may content ourselves with giving some ordinary directions, and retire from the apartment. But if they are returning with frequency and activity, we must not allow much time to elapse before we require to make an examination *per vaginam.*

An objection may be raised by the patient to the necessary examination being then instituted, under the idea that *no assistance* can be rendered her so early in the labour. As I would regard the feelings of a parturient woman in a degree only secondary to her safety, I would by no means insist on putting her to this inconvenience, unless I thought it quite indispensable. But, as much valuable information may be gained by this first examination, and as it is highly desirable to obtain that information during the progress of the first stage, it is right, firmly but gently, to urge its propriety. It is seldom, indeed, that she will not accede to the recommendation of her medical attendant, provided he possesses her confidence, and conveys his request with becoming delicacy.

Much knowledge must be acquired during the first vaginal examination: it is, first, whether the woman be pregnant; secondly, if she be in labour; thirdly, whether the membranes have ruptured, or are still entire; fourthly, how the child is presenting; fifthly, how far the labour is advanced; and sixthly, the state of the os uteri, vagina, and perineum, in regard to their distensibility.

It may be thought superfluous to recommend that one of the points of inquiry should be whether pregnancy really exists, under the supposition that no woman could believe herself in labour unless she had approached near the termination of utero-gestation.

But instances are daily occurring which prove the fallacy of this mode of reasoning: and on many occasions professional men have been in attendance for days and weeks, relying on their patient's assurances, perhaps often advanced, that she was with child, when it has turned out she was mistaken. They have thus most undeservedly exposed themselves to some censure, or what is perhaps more mischievous than direct censure, to quizzical innuendos and sarcastic ridicule.

Many unhealthy actions will cause the abdomen to swell—especially about the period of the cessation of the menstrual discharge,—and to simulate the external appearance of gestation; and even in the absence of pregnancy, spasms of different muscles may sometimes tolerably closely imitate, as to sensation, situation, and severity, the commencing pains of labour. While this gradual enlargement is going on, the woman will find no difficulty in persuading herself, or in being persuaded by others, that she is pregnant; and when the spasmodic pains set in, she will as readily conclude that labour has begun. Under such circumstances, the medical attendant has probably no opportunity of forming a correct judgment, except from his personal observation at the time he is hastily summoned.

Provided the uterus be unimpregnated, the deception may generally be detected, simply by placing the hand on the abdomen; but if that proceeding does not afford the required information, an examination *per vaginam* can scarcely fail to prove satisfactory. On examining the abdomen externally, it will be found distended—perhaps from flatus pent up in the intestines—perhaps from fluid effused into the peritoneal cavity—or from the presence of some more solid tumour. We may distinguish that the swelling is softer or harder, larger or smaller, more diffused or more circumscribed, than is the bulk of the gravid uterus; that it is not of the same shape, is very likely irregular on its surface, does not occupy the same position, and, above all, that it does not possess that peculiar springy elasticity which so strongly characterises the impregnated womb at the end of the natural term of gestation. If there still remains any doubt, it is right to make a vaginal examination. Under this condition of *spurious pregnancy* the os uteri will be found not only close, but undeveloped; the cervix not expanded; and the uterus itself, on poising it at the extremity of the finger, will be felt small, light, and moveable;—provided, indeed, it be not diseased. If, on the contrary, the patient be pregnant, and near the end of the term, we shall find the os and cervix uteri fully developed and expanded, and perhaps the os uteri somewhat open; so that we may be able to detect the presence of a fœtus through the dilated mouth or thinned neck.

But the patient may be pregnant and not in labour,—the pains may be spurious and not true. If what has been already advanced in regard to false pains be carefully studied, I trust there will be no great difficulty in forming a diagnosis. We will presume, as indeed we shall find most usually the case, that the patient, on our arrival, is in the first stage of labour, experiencing the dilating or *grinding* pains.

Position of the Patient.—The most convenient as well as easy posture which the patient can take, and that which seems best adapted for facilitating the descent of the head through the pelvic brim, is the one usually chosen in this country—the left side, with the shoulders inclined forwards, so that the spine may be somewhat curved, the thighs flexed upon the pelvis, and the legs bent upon the thighs. In this position, as has been before shown, the axis of the pelvic entrance is brought, as nearly as can be accomplished, into a line with the axis of the trunk; and the muscles passing over the pelvic brim, particularly the psoæ, are more perfectly relaxed than in any other.*

It is better that she should be undressed, excepting her night-clothes, and a dressing-gown; and that she should lie on a mattrass rather than a softer bed. She should be also covered by a light counterpane, or a blanket, and a sheet.

In this position *the vaginal examination* is to be conducted in the following manner:—The attendant, sitting rather behind her, and having anointed the two first fingers of his *right* hand with some unctuous substance, mostly in readiness, is to place them on the labia externa; then, gently separating these organs, he must introduce the first finger into the vagina in the direction of its entrance, which is backwards and upwards; or he may take the perineum as his guide, and insinuate his finger within the genital fissure, posteriorly, close to the fourchette.† Having introduced it as high as he conveniently can, he must pronate his wrist, so

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* In many parts of the Continent the women are delivered in the half-sitting, half-recumbent posture. In France they lie on the back, with the knees drawn up. In other countries they sit upon the knee of an assistant. The peasantry of Ireland place themselves on their hands and knees; and Mr. Michell (on the ergot) states, that in Cornwall it is difficult to persuade a woman in labour to take any other posture than either standing or on her knees.

† The object of covering the finger with some oily substance before making an examination is two-fold: partly because the lubrication assists its introduction, but partly also to diminish the chance of inoculation with morbid matter, should the patient be labouring under any venereal affection. Three of my intimate medical friends have suffered most severely from secondary symptoms of syphilis communicated in this manner; and five different midwives of the Royal Maternity Charity have been the subjects of the same disease, contracted through an abrasion of the cuticle, while in attendance on women in labour. These are grievous accidents, and no means should be neglected by which such a serious consequence may be avoided. If, unfortunately, a suspicious-looking sore should make its appearance on the finger, all obstetric duties must be abandoned until after it is healed; for another woman may be infected from the contact of an open chancre on the hand of the medical practitioner.

that the junction of the first and second fingers shall fit in under the symphysis pubis. (Plate 42, fig. 1.) In this way he will be able usually to reach the os uteri without difficulty. Should that organ, however, be situated so high that he cannot perfectly command it,—rather than remain in ignorance of its condition, and of the presentation of the child,—he may introduce the first two fingers of his *left* hand, (fig. 2); and as these may be passed higher within the pelvis, they will give a greater facility for inquiry.*

These examinations are commonly made during the urgency of pain; and this has given rise to the phrase of "trying a pain." It is, however, desirable, on many accounts, that we should not introduce our finger up to the os uteri at the time when the uterus is acting strongly; because then the membranes are protruded into the vagina, and if we press against them at that moment, we may probably rupture the cyst, and lose its influence in the after progress of the labour. Besides, it is impossible under such protrusion to ascertain the presenting part of the fœtus with precision, because of the quantity of water which is then interposed between our finger and its person. Nevertheless, as it is expected that we should examine while the uterus is in action,—and, indeed, as in many cases the patient would not allow us to pass our finger at all, were it not for the belief that we can assist her, and that only in the time of pain,—it is necessary that we should request her to inform us when there is a return, and take that opportunity of introducing our finger within the external parts. Having gained this advantage, we must allow it to remain inactive in the vagina while the pain continues; and upon its cessation, which we have seldom any difficulty in ascertaining, we may direct it up to the os uteri.

The condition of that organ with respect to its actual dilatation, and its dilatability, whether the membranous cyst is ruptured or is still entire, the presentation of the child, and the degree of relaxation which the vagina and the perineum have already taken upon themselves, will all become matters of observation during this primary examination.

In regard to the first of these points, it is not always easy for a novice to distinguish the mouth of the womb at the commencement of labour. I have known many students attend a number of cases before they had been able to detect the os uteri by the feel, or satisfy themselves where it was situated. I have before stated, that it will generally be met with about two inches or two inches and a half from the vulva, looking back towards the sacrum or coccyx.

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* The two figures in plate 42 show the os uteri in the process of dilatation, and the mode of examination; fig. 1 displays it but slightly opened; fig. 2, when it has acquired a greater diameter.

Being satisfied that we feel the os uteri, we must next ascertain whether the membranous cyst has broken or not. It is not always easy to determine this point, either, in the *interval* of uterine contraction; because the membranes being then flaccid, retreat, together with the contained fluid, within the uterus; and there remains merely a thin skin, as it were, between the finger and the presenting part of the child; so slight, indeed, as scarcely to be perceptible to the touch. But as soon as pain returns, the soft wedge, if unbroken, is again felt protruding through the os uteri, and there is then no difficulty in detecting it. If, therefore, we have not been able to learn, in our first examination, whether or not the liquor amnii is evacuated—inasmuch as we have carried our finger up to the os uteri in the *absence* of pain,—we may take the opportunity of examining again when the next contraction comes on; and on passing the index finger up to the pelvic brim, while the pain is urgent,—most carefully, lest we should rupture the sac prematurely,—if we distinctly feel them protruding downwards into the vagina, we know that the membranes are still entire.

Again, it is of first importance that we should ascertain what part of the child presents, even before the membranes rupture. The necessity, indeed, of determining the presentation previously to the discharge of the waters, is denied by some obstetricians of great authority.*

With such a dangerous sentiment I can by no means coincide; considering it imperative on every practitioner—provided the labour has made any progress—not to leave the patient's room until he has perfectly satisfied himself that it is the head which offers at the brim: for, as occasionally transverse presentations occur—as, under such a mal-position, it requires that a change in the situation of the fœtus should be artificially made before the birth can be perfected—and as that change is comparatively an easy operation previously to the bursting of the membranes, but is rendered one of the most difficult in surgery if much time is allowed to escape after the evacuation of the liquor amnii—so it necessarily follows that the advocates of such a doctrine run the risk of lulling their disciples into a perilous and fatal security. It is certainly not always an easy matter to distinguish the presenting part at the onset of labour, by the first finger of the *right* hand, because, occasionally, it lies too high for detection in that manner: but it is seldom that some part of the child's body cannot be felt, if two fingers of the *left* hand be introduced into the vagina; since they will almost always command the whole cavity of the pelvis, and may be passed up to the very brim. Whenever, then, any doubt arises as to the position of the fœtus, it is much better to have recourse to this second expedient than to remain in ignorance of so material a point.

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* Blundell's Principles of Obstetricity, by Castle, p. 235.

Discriminating marks of a Head Presentation.—The head is distinguishable by its large volume, its roundness and firmness, and by its constituent bones being intersected and separated from each other by open lines and spaces; for it is seldom, when the os uteri is dilated to the size of half-a-crown or a dollar, that we cannot detect some portion of a fontanelle, or one of the sutures. There is little chance of any other presentation being mistaken for the head, except the breech, and perhaps (as I have known happen) the side. The breech is most likely to be confounded with the cranium, because it possesses a larger circumference than any other part of the child's body, except the head; but it still differs from the head materially in its general size, and more particularly in feeling to the finger softer—not so resistant, but more *cushiony:* it is also more pointed, and possesses no structure resembling a suture or fontanelle. The principal discriminating marks of the presence of the breech, however, of which I shall speak more at length hereafter — are the anus and genitals. The only point of structure in the side that bears the least shadow of resemblance to the head, consists in the interosseous spaces between the ribs, one of which might possibly be mistaken for a cranial suture. As mistakes have been made in this particular, and as it is consequently well worth while drawing distinctive marks between these two parts, I may observe, that at the commencement of labour under a side presentation, the body of the fœtus seldom descends upon the brim, or into the pelvic cavity, so readily as when the head offers itself; the shoulder and breech being then supported by, and resting upon, the respective ilia. It is, therefore, generally quite out of the reach of the finger, until after the membranes have broken; and this of itself would be a suspicious circumstance. Secondly, the space between the ribs is wider than any suture of the head — unless, indeed, the fœtus be hydrokephalic; and, thirdly, we may usually detect more than one interosseous vacancy. Now, as there are no two sutures in the cranium that run in parallel lines, if we can trace more than one such space by the finger, we can be at no loss to determine that they are both intercostal.

Having ascertained by the marks enumerated that the head presents, we may be content with this information. It is by no means necessary, or desirable, at present, that we should perplex ourselves with endeavouring to make out the nice distinctions between the different parts of the head, so as to say exactly whether the face is directed to one side or the other; or whether the vertex presents, or any other point. It is sufficient that we have assured ourselves the head is at the brim; and we may take it for granted the vertex offers, unless, indeed, we can clearly distinguish the marks of some other part. This recommendation is not given to impress the student with the idea that it is enough to make a careless examination, but to prevent his doing harm by any attempts to inform himself on such a difficult matter—harm by irritating the vagina and os uteri—but especially by prematurely rupturing the membranes, which it is highly necessary to preserve whole. For, in irritable habits, we shall often find that the most simple examination is sufficient to cause an accession of uterine pain: and if—only intent on ascertaining how the head is situated, without reference to the preservation of the bag—we carry our finger round, within the os uteri, we shall most likely induce action, and the membranes will be more or less suddenly protruded against its extremity. The finger then passes into the centre of the aqueous cyst, the liquor amnii discharges itself, and irreparable mischief is done. Let us then—if we have clearly distinguished the head over the os uteri—presume that it is placed in the most favourable position for its descent into the cavity of the pelvis, until the membranes have given way. We may after that proceed to examine the presenting part more accurately: and, provided the labour does not progress favourably and satisfactorily, we must take pains, in all cases, to learn whether the delay be owing to a mal-position of the head; or to some other of the many and various causes that may retard its advance.

When the first examination has been made, the patient herself, and her friends, are always anxious to learn from her medical attendant if all be natural and satisfactory, and how long is likely to elapse before the labour will be terminated. With regard to the first question, if we have gained all the information which I require we should do, we may give a decided answer; but the second must be evaded. If we find the vagina distensible, the os uteri dilating, the head presenting, and the pains sufficiently active, we may reply, with a positive assurance, that so far everything is favourable; that no case can afford a more auspicious promise than the one under our care; and that, therefore, we are warranted in anticipating a fortunate result. To the second question, let us not attempt a reply; let us take it for granted, after such a positive declaration of good tidings, that *it* will not be repeated; and, as society is at present constituted, whoever obtains a plain, straightforward answer to one out of two questions, ought to consider himself fairly dealt with. But if the party we are addressing thinks differently,—which we shall most usually find the case,—and presses the subject again on our attention, let us tell them plainly, they ought to remain content with the honest declaration we have given, that the case is progressing as favourably as possible; that it is out of the scope of human knowledge, and consequently quite out of the power of any human being, to say positively when the labour will be terminated. Any opinion we might form would be but a guess, at the best; and it is not fit that we should trust an answer which may involve such serious disappointment to conjecture. If we were to make a promise that the labour would be brought to a close either at noon or midnight, or any other specified moment, we might be disappointed in two ways. It is very unlikely that it should end just at the period of time we have mentioned; it might be earlier, and then an inference would be drawn, that we knew nothing about the case: but it is also probable, that the time fixed upon will pass by, without our promise being fulfilled; it will then act most injuriously on the patient's mind; she loses confidence — that loss of confidence is attended with dejection,—the nervous system is depressed,—and the process of labour is more or less interfered with. By making promises of this kind, indeed, we may be the means of producing a lingering, painful, dangerous, an instrumental, and perhaps a fatal case. Upon such trifles, sometimes, does the welfare of our patient depend!

Frequent examinations should not be made during the first stage of Labour;—We can do no good by such a practice, after we have once gained the information we require; we cannot facilitate the descent of the child; we cannot dilate the parts; but we may do a great deal of injury; for we denude the vagina of that soft relaxing mucus which is designed by nature to protect it, and we moreover run the risk of destroying the integrity of the membranous cyst: we may, therefore, predispose the parts to inflammation, and retard the dilatation of the os uteri itself. As, however, it is a common idea among women that, under each examination, material assistance is rendered, we shall frequently be urged, during the first stage,—especially if the labour be rather slower than usual,—to remain in close attendance upon the patient's person; and these solicitations are generally advanced with a degree of fervency that it appears the extreme of cruelty not to accede to. Should this be the case, the finger may be introduced, from time to time, with the greatest care and gentleness; more to pacify the patient's mind, and assure her she is not neglected, than with any other view beyond that, and also watching the progress of dilatation. The more rigid the parts are, the more do they require the softening influence of the natural secretion, and the more careful must we be to preserve it.

A question naturally arises, whether we shall remain in the bedroom, or may with safety return home. It is not right that we should stay in the same chamber with the patient, during the first stage; because there is a frequent inclination to pass urine and fæces; and she will be compelled to restrain that desire, as she will probably not like to be constantly requesting her medical attendant to retire. It is not necessary for us to remain with her; all that is required being, that we should overlook the process, and be at hand to act on any emergency occurring. We may retire, then, from the room, and direct the nurse to apprise us as soon as the pains become stronger, and particularly if the membranes rupture. In about an hour—should we receive no summons in the mean time—we may see her again, and may then, if we think it right, make another examination, to ascertain that the labour is proceeding satisfactorily. But if it is not necessary for us to continue in the chamber, or by the bed-side, is it desirable for us to return home? In this question, the comfort and convenience of the medical attendant are much interested; and its answer must depend, in a great measure, on circumstances; such as, whether it be a first or subsequent labour; whether the previous labours have been quick or lingering? how far the os uteri is dilated or dilatable, and particularly the distance of her residence. If it should not be above a few minutes' walk from one house to the other, it is not necessary that we should stay at the commencement of labour; but if the distance be great, —especially if the patient have had children before, and her labours have been quick,—even should the os uteri not be dilated more than to admit the point of one finger, provided the pains are following each other rapidly, it is better not to leave the house. As a general principle, I would advise, that in all cases, as soon as the os uteri has acquired the diameter of half-a-crown, sufficiently large to admit the point of four fingers just within its disc, the attendant should not be absent from the house for more than a quarter of an hour or twenty minutes at a time; because, although it may have taken five or six hours to dilate from a close state to that dimension, the subsequent process of dilatation may go on so rapidly, that a few more pains may accomplish the delivery; and that before he can arrive.

Some practitioners* recommend that, although our presence is not required in the lying-in chamber, still we should not occupy ourselves in any employment or amusement, while we remain in attendance. They argue that, inasmuch as we receive a consideration for our time and service, our whole mind should be entirely devoted to the woman's safety, and in suggestions for her comfort. From this sentiment I entirely dissent. I grant that we ought to afford every necessary and proper attention, whether we are remunerated or not; but, in common cases, such an entire devotion of our mental faculties is not required; and we may produce a hurtful impression by our apparent anxiety. It is natural for a man who is not of an indolent disposition, but whose mind is usually directed to some object, to become *fidgety*, if his attention be not occupied by any pursuit; he will, perhaps, be pacing the drawing-room, where the husband is sitting; and by a mere absence of manner, which he can scarcely disguise, he will convey an idea that he is more than ordinarily anxious on account of the lady. Such an impression will find its way through the crevice of the door to the lying-in chamber; it will reach the invalid herself, and is likely to produce all the disadvantages which result from depressed spirits. Let him occupy himself, then, in some way that best suits his taste, either writing or reading; and there are few books he may chance to take up but will afford him either amusement or instruction.

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* Hamilton, MS. Lectures, 1820.

It is by no means requisite that the patient should continue in one posture during the first stage; she may relieve herself by changing her mode of lying, by sitting up, or walking about the room; for she will soon be able neither to sit, stand, nor walk, but will be compelled to take a definite position on the bed, from which, in ordinary cases, she is not to move till after the termination of the labour.

She may be allowed any bland, fluid nourishment that she fancies; but it is very little she requires. The attendants about her are usually solicitous that she should take sustaining food, and perhaps even stimulating drinks. But these must be forbidden: the process of digestion does not go on under labour with sufficient energy to assimilate solid animal food; and anything likely to excite the circulation would have a tendency to induce fever. A little beef-tea may be taken; but farinaceous preparations, or tea, or coffee, are much better; and we shall generally find that, inasmuch as the digestive process is almost suspended under labour, so there is very little desire for nourishment; and what is swallowed beyond the simplest fluids, is more in compliance with the entreaties of her officious friends, than from any appetite or inclination of her own.

DUTIES DURING THE SECOND STAGE.—The second stage of labour having commenced, we are summoned to the patient's bedroom, if we have been absent, and told that the "waters have broken." She is most likely found reclining on the bed, and probably the pains are more urgent than they were before, or perhaps they are somewhat suspended. We now require to make another examination, because it is possible that the head may have fully entered the cavity, and may be soon expelled. Finding it low in the pelvis, finding the os uteri almost entirely dilated, the membranes broken, and the pains strong and coming on frequently, it is right not to leave the room; but unless the perineum be somewhat on the stretch, we need not yet take our post exactly by the bed-side.

But as soon as the head has come to press upon the external parts,—particularly when it has made its turn, and is beginning to extend the structures at the outlet of the pelvis,—it becomes our duty to take our seat by the bed-side, and never to move from our position till the child has passed. This we do to protect the perineum, in order to prevent laceration.

For the purpose of supporting the perineum, we sit rather behind the patient, and apply the palm of the left hand—guarded, for the sake of delicacy, cleanliness, and convenience, with a soft napkin—steadily and firmly against the perineal tumor.

To give the required protection, it is not necessary that we should make powerful pressure, or resist the child's exit by the employment of any exertion; we are only to afford a passive support. Placing our elbow on the bedstead, we render it a fixed point, and rather allow the head, covered by the thinned structures, to be protruded against our hand, than forcibly press our hand up against the head. This part of the duty of the obstetrical attendant is sometimes exceedingly fatiguing. We may occasionally be compelled to remain many hours by the side of the bed, without moving from our seat. It is not to be wondered at that, under such an irksome posture, the hand should become numbed, and the whole body cramped; but we must put our personal inconvenience quite out of the account, when weighed against our patient's safety; and we must recollect that the more rigid the parts are,—the longer time they take in dilating,—the more our assistance is necessary. We must not permit any length of time that we may have been so fatiguingly occupied, to rise as an excuse for relaxing in this duty; but always bear in mind, that if the uterus act strongly, and the head be protruded suddenly, while the parts have not the advantage of the support we can afford, there is great danger that such a degree of laceration may occur, as will perhaps render the woman miserable for the rest of her existence.

Most women remain tolerably quiet, in one position, during the second stage of labour; but some are exceedingly irritable, tossing about in all directions, will not be advised, and can scarcely be restrained. It is our duty, by all the means in our power, both of persuasion and gentle force, to prevent such a patient injuring herself by suddenly starting away from our protection; for many cases have happened where a rupture of the perineum, under such circumstances, has occurred to a frightful extent; and, by a little management, we may generally succeed in confining her sufficiently. I have already mentioned, that the thighs must be drawn up towards the abdomen, and the legs bent a little back upon the thighs, the whole person lying on the left side; and the patient is usually placed so that her feet may rest against the bed-post: in this way they become a fixed point, and keep the pelvis steady. We render the shoulders, also, another fixed point, so as to steady the upper part of the body, by tying a long napkin, or a round towel, to the same bed-post, and desiring her to hold it in her hand. We tell her, when the pain comes on, to press with her feet against the bed-post, and pull gently at the towel, cautioning her against straining violently. The consequence is, she so fixes her person as to render it almost impossible for her to jump away suddenly, or to recede to any distance from us. Independently of this little manœuvring—when the head is in any degree extending the vulva—the nurse must be required to raise the right knee to some distance from the other, by which means the thighs are separated, and an increased facility given to the exit of the head through the external parts, as well as some control exerted over the patient's movements.

It is very probable that the nurse may wish to substitute a pillow for her own services, and persuade us it will do equally as well. For four reasons, the pillow must be objected to: it increases the heat of the person, already, perhaps, profusely perspiring; it does not afford a support sufficient to prevent the legs from being squeezed together; in the acmé of pain it will often slip away from between the knees, and we lose its advantage just when we require it the most; and, lastly, it can be of no service in restraining the woman in one posture.

The extent of injury to which the perineum is liable varies much in degree, from a simple laceration of one or two fibres at the anterior edge, to a rupture of the whole organ, the destruction of the sphincter ani, and the conversion of the two canals,—the vagina and rectum,—into one common cavity. The rent sometimes commences at the fourchette: more frequently it will begin in some portion of the inner membrane of the vagina, and extend anteriorly to the edge of the perineum, when it will be again continued back through the integuments to the point corresponding with the origin of the laceration within, or will even pass beyond it; and more rarely the head is protruded through the substance of the perineum itself, forming a fresh aperture, by which it escapes, leaving the fourchette entire.* Of this latter variety I have myself seen four instances.†

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* For a case of this kind, see Merriman's Synopsis of Difficult Parturition, p. 249. See also Denman's Introduction to Midwifery, chap. ii. sect. 7, who very aptly calls the accident a "bursting or perforation of the perineum;" Baudelocque, tom. i. sect. 152; and Med. Gazette, August 19th, 1837, for one reported by Dr. Rigby.

† The first case was more than a month after delivery in a primary labour; the perineum had puckered, and the aperture had united, with the exception of a fistulous orifice, communicating with the vagina, large enough to admit the passage of a swan quill; there was a puriform discharge going on. I learned afterwards that this healed perfectly. The second was also a first child, and the woman was forty-eight

Varying much in time, varying much in the intensity of agony which is suffered, and in the number of pains that occur, the head is at last protruded, in the manner before noticed. It is

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years old. My friend had been with her all day; and late at night, in consequence of great rigidity, he sent for me. About half an hour before my arrival, he observed the perineum become thin and soft near the anus, while its anterior edge was very thick and rigid; presently the back part of the perineum gave way, and the point of the right shoulder protruded, the vertex at that time being external, separating the labia pudendi. By some management he raised the head, and it bounced through the lacerated opening; the body soon followed, and I immediately entered the room. The child was dead. He had just divided the funis, which I found hanging out of this new-made opening. I passed it back into the vagina, and out at the vulva, and extracted the placenta, which was lying quite detached. The third case was somewhat similar; it was a first child, and the labour had been lingering from the commencement. The soft parts were very rigid, and the head was pressed very much back towards the anus, distending the posterior part of the perineum exceedingly. Fearing a laceration, the gentleman in attendance, Mr. Coward, of Stepney, called a neighbouring practitioner to his assistance, and both used their best efforts to direct the head forward, and preserve the perineum from injury. In spite of all their exertions, a transverse laceration took place near the anus, through which came a shoulder and elbow; the head at that time being partially protruded through the vulva. The shoulder was supported; the head was shortly expelled through the natural outlet, and the body of the child followed. I saw the patient in about two hours, and found a jagged, lacerated aperture, between two and three inches in length, in the perineum, extending from the sphincter ani behind, to within an inch of the fourchette anteriorly; some of the fibres of the sphincter had given way; and higher up, the recto-vaginal septum was torn to the extent of two inches; no fæces, however, passed at any time by the vagina. I put in two sutures, but these sloughed out speedily. In six days granulations were luxuriant; the puckering and healing process went on uninterruptedly; and in three months the aperture was perfectly closed; but the vagina remained much contracted. (See the case as reported by Mr. Coward. *Med. Gaz.*, Oct. 28th, 1842, p. 146.) The last case happened to myself in the summer of 1843. It was the lady's second child. The first labour was very lingering; the infant was born dead, and a considerable sloughing of the back part of the vagina took place, for which I was first consulted. This healed, with an extensive cicatrix. In her second pregnancy she was placed under my care, as her previous attendant, being a relative, did not wish to take the charge of her. The first part of the labour went on tolerably well, though slowly; and about six hours after the membranes broke, the head was in the pelvis with the face forwards. I could then feel both eyes and the nose distinctly, and the head was pressing strongly against the band formed by the cicatrix, which appeared to be relaxing. I expected it would become a complete face case; but the vertex was directed downwards, and the forehead remained behind the pubes. The pelvis was narrow at the outlet, owing to the tuberosities of the ischia approaching too near to each other, and the arch of the pubes being too much forked. After I had remained with my hand supporting the perineum more than two hours, the band at that time having relaxed very much, and the head being so far protruded that the anterior fontanelle was external, I felt the perineum, near the anus, become suddenly thinned; it burst, the head receded from the vulva, and made its escape through the laceration. The body instantaneously followed. Having separated the child, I detected another presenting with the feet; the membranes almost immediately broke, and the feet came through the same aperture. I extracted the trunk and head as carefully as I could. The placentæ were thrown down into the vagina; and not liking to run the risk of increasing the laceration, I passed both funes through the vulva, intending to extract them that way. The constriction, however, was so great, that I could not bring them through it. I was therefore compelled to pass the funes back again through the new-made opening; when, applying a slight degree of traction, I delivered them without difficulty. The portion of the perineum near to the fourchette, left entire, was about an inch in extent. A poultice was applied. On the fourth day the whole of the most likely the child may attempt to gasp the moment the head is expelled; and on this account it is right to wipe its face immediately with a clean napkin (of which necessary articles we always require to have a store close at hand), lest in the first inspiration some of the mucus which may hang about its lips, or other moisture, should be inhaled.

Coiling of the funis around the neck.—I have already mentioned that some little time usually elapses between the expulsion of the head and the pain that is to expel the shoulders; and this interval may be usefully employed, after the face is cleansed, in making an examination of the neck, to ascertain whether a fold of funis may not possibly be surrounding it (pl. 41). It frequently happens that there is one; sometimes there are two, and occasionally three or four, folds of the naval-string coiled around the neck; and if it were not liberated, it is very possible that the pain which expels the shoulders might cause the placenta to be dragged away from its attachment, to the great peril of the mother, from hæmorrhage; it might even cause an inversion of the uterus. But the chief danger is to the infant. If on its expulsion the cord be drawn tightly round its neck, the circulation through the funis will be arrested by the compression of the vessels; and the same compression may also close the trachea to such an extent, as to prevent the ingress of air into the lungs. Thus the two sources by which life is maintained being cut off at the same time, strangulation must be a necessary consequence. I was once witness to the death of an infant under such circumstances. When I arrived at the patient's house, I found the child lying dead near the external parts of the mother. The funis umbilicalis was twice coiled round the neck, and the child had been deprived of the advantage of the placental circulation, and of the power of breathing at the same time and by the same means. There was a deep livid ring encircling the throat, produced by the pressure the funis had caused; and it was evident from this mark that the infant was alive at the moment of its birth. It is a most interesting and instructive case, not only obstetrically and physiologically, but particularly with respect to forensic medicine. If this birth had taken place under suspicious circumstances, and the mother had not been a married woman, it is very possible that

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lacerated surface was in a sloughy state; this separated kindly. The perineum puckered somewhat, granulations sprang up, and cicatrization commenced at the edges. It was now evident that union of the two granulating surfaces would not occur; and, in consultation with Mr. Hamilton of the London Hospital, it was determined to divide the frænum. This was done; the healing process went on very favourably, and in eight or ten weeks from her confinement she might be considered well, the entrance to the vagina being, of course, much enlarged. Both the children were living, but I did not allow her to nurse either. In none of these four cases was the rectum or bladder injured.

a charge of murder might have been founded on the appearance of the mark round the neck; as it could not be distinguished from the effects of a cord, applied with the intention of destroying life.

The best way to free the funis from this awkward situation is by drawing down the loop, and passing it over the child's head, by which means we liberate it entirely, and it is no longer an impediment to the expulsion of the shoulders. But it occasionally happens,—especially if the funis be more than once coiled round the neck,—that it is not sufficiently long to allow its being pulled over the head: we may then keep the loop distended with our fingers, until the shoulders are expelled, and they must be allowed to slip through it. In some cases it is not possible to carry into effect either of these modes of liberating the child; and I have found it necessary to cut the funis before applying a ligature, while the shoulders were still unborn. Such a proceeding, however, should be avoided if possible, because the child might be strangled in its birth, if respiration were not perfectly established; or it might bleed to death, unless we were very careful to secure the umbilical vessels by compression with the finger and thumb until a ligature could be obtained.

Directly the head is born it is usual for some one of the attendants to offer to the medical practitioner a close flannel cap for the infant, which he is expected to apply as soon as a convenient opportunity occurs; and this is done under the idea that, of all parts of the body, the head is most susceptible of the action of cold. As far as I know, there is no good ground for this assumption; but inasmuch as the custom is dictated by a very universal prejudice, it is as well to give way to it, unless other more important duties require immediate attention; for should this very necessary precaution, as it is supposed, be omitted, and the proffered means of protection be rejected with indifference or scorn, it is more than probable that any little ailments the child may be subject to during the first few weeks of extra-uterine existence, will be attributed to the neglect shown in this particular.

Support of the perineum during the expulsion of the body.—Although the shoulders of the child take up less room than the head, and although the parts, having been previously distended by the passage of the larger substance, generally easily admit the shoulders—provided the child be of normal shape—still it is desirable that support should also be afforded to the perineum while the body is being protruded, even after the head has made its exit. Having wiped the face, and made an examination to ascertain that the funis is not twisted around the neck, we may again place the left hand on the perineum, while we direct the fœtal body rather forwards,—in correspondence with the axis of the pelvic outlet,—and receive it with the right.

It used to be the custom to surround the neck with the thumb and fingers of both hands, and forcibly extract the body the moment the head was in the world, for the purpose of liberating the woman from pain, and terminating the delivery as speedily as possible. Such practice is attended with double danger;—great chance of injury to the child, by the tension of the neck; and no small probability of hazard to the mother, by the uterus being prematurely emptied. It is thus left in a flaccid state; the stimulus which previously disposed it to contract is suddenly taken away; that disposition ceases, or is suspended; hæmorrhage is induced; a necessity probably arises for the artificial removal of the placenta; and incalculable mischief is the consequence. Those persons who commend such meddling interference, and who estimate the skill of the obstetrical attendant by the rapidity with which he can extract the body after the head is born, found their eulogium on most dangerous premises.

When the shoulders have passed, the parts require no further protection; the breech and legs are generally soon expelled, with slight suffering, and little hazard to the maternal structures.

The child, then, being entirely in the world, it must be slowly removed to a little distance from the mother's body, not more than to the extent of four or five inches, and withdrawn from beneath the bed-clothes, the woman's person being still left perfectly covered and concealed. It has been already shown that the funis umbilicalis varies exceedingly in length, and that sometimes its measure has been known not to exceed half a foot. Now, should the cord be unusually short, and should we hastily draw away the infant to some extent, we shall *make a pluck* at the placenta; and we run the risk of tearing it away from its attachment, or, perhaps, of even inverting the uterus. If we find the cord sufficiently long to permit the further removal of the child's body, we may place it more entirely under our command; and after having lifted the bed-clothes from above it, so as to bring its person completely into view, we may proceed to secure the vessels, and separate it from the mother.

The ligatures commonly employed in London consist of eight or ten pieces of thread or silk, a skein of which is placed in readiness for our use. A sufficient number having been selected to form the proper thickness, a knot must be tied at each end; and this preparation should be made before the child is born. Even in forming the ligature some attention is requisite: if it be too thick, it will not compress the arteries sufficiently to prevent bleeding after the funis is cut; and it is also liable to lose its hold, and slip altogether off the cord, thus leaving the vessels perfectly unprotected: and if, on the contrary, it is too thin,—consisting only of two or three threads,—it will probably cut through the membranes covering the cord, as well as the coats of the vessels themselves, and cause in this manner a loss of blood to the infant. It is also necessary that the threads should be all of equal length; for if one or two be shorter than the rest, they alone will make compression; and consequently they will act as though the ligature were composed of them only.

Two of these ligatures at least must be prepared; one is to be applied about three fingers' breadth—two inches—from the child's navel, must be drawn tight, and strongly secured by a double knot. A second must be placed nearer the placenta, at about the same distance from the first that the first is from the body of the infant; and a double knot made as before: the funis is then to be divided between them.[*] It is as well, previously to tying this second ligature, to squeeze as much of the blood as we can out of the space intervening between the two, up towards the placenta, lest, at the moment the division is made, some should be projected on our dress.

The object of the second ligature is twofold—cleanliness and safety: if the cord were cut beyond the first ligature, without securing the placental end, the blood contained in the umbilical vein and placental vessels would be squeezed out, and run upon the floor, or on our own clothes. But especially is this addition to be used as a precaution against the possibility of danger; for if the gestation had been double, and if (which, however, is a very rare occurrence) the circulations of the two children anastomosed in a placenta common to both the systems, so that the blood of each circulated in the body of the other reciprocally, it is possible that the unborn child might bleed to death through the divided funis of the one already in the world; provided the end of the cut vessels were left unprotected. We need not fear that the woman would lose any blood from her system through the open vessels of the cord, even although the placenta remained attached to the uterine surface; because there is no direct vascular communication between the uterine arteries and the umbilical vein.

There is danger in placing the first ligature close to the body of the child, lest we should include a portion of intestines protruded through the open umbilicus into the cord—a variety of congenital hernia by no means rare[†]—and lest the compress should not be tight enough to prevent hæmorrhage, in which case we have no space left to apply another ligature upon;* and there is danger also in dividing the funis too near the first-made ligature, lest it should slip away from its hold, and the vessels be no longer secured.†

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[*] Smellie, (vol. i. p. 196,) Baudelocque, (parag. 848,) and Dewees, (parag. 485,) recommend the employment of one ligature only, near the body of the child; and the reason assigned is, that the escape of blood from the open vessels of that portion of the funis left attached to the placenta, by diminishing the bulk of that mass, facilitates expulsion. This practice rests upon erroneous premises, as the placenta is equally well thrown off, whether its vessels are allowed to bleed or not.

[†] Meigs, (Treatise on Obstetrics, 1852, p. 213,) says that a case came within his

The funis must be divided by a pair of blunt-pointed scissors, to prevent the possibility of the infant being injured by the extremities of the blades. For the purpose of protecting it further, also, the thumb and third finger on the left hand must embrace one portion of the funis,—being placed over the ligature which is nearest to the child's body,—while the other ligature is held between the first and second finger of the same hand; and the section must be made between them by one cut. If one portion of the funis only be held, and that carelessly, while the division is being made, it is by no means impossible that one or more of the child's fingers or toes might be taken off at the same time, as in the case recorded by Merriman;‡ or the penis even might be amputated, as occurred in an instance that came under Denman's observation, and which he used to detail in his lectures.§ It will

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knowledge in which a careless accoucheur, in dividing the funis, "cut off the top of an arc of intestine protruded through the ring."

* If there be much gelatine in the cord, it oozes away after the funis is divided, and leaves the ligature slack; the consequence is, that the vessels are no longer compressed, and both the arteries and vein will bleed; or the vessels may be diseased, which also, generally, will cause hæmorrhage from them. For this reason it is right always to examine the umbilicus of the child, at the first convenient opportunity after it is separated. (See Radford's paper, Edinburgh Medical and Surgical Journal, vol. xxxviii., p. 1, July, 1832; and Churchill's Op. Mid., p. 292.)

† There was an absurd notion formerly prevalent in relation to the length of that portion of the funis left attached to the child's body on its division (see Dionis's Midwifery, English translation, p. 298, Culpeper's Mid., 1718, p. 64, and Chamberlen's Complete Midwife's Practice, 1665, p. 14), which is commented on by De Graaf (Amstedel. 1705, p. 72.) in the following words: "Ineptum est illud obstetricum figmentum futurum penem majorem, si vasa umbilicalia non proximè ad umbilicum ligentur."

We have no account of the time at which the division of the funis was first practised: the origin of that custom is lost in the depth of ages. That it was universal in Greece, is clear from the term familiarly used to designate midwives; they were called ὀμφαλότομαι—that is, literally, navel-cutters. But from the works of Hippocrates we gather that it was the practice to leave the funis undivided until after the placenta was expelled. The prophet Ezekiel is probably the first author who has directly alluded to this part of the midwife's office. In the 16th chapter, likening Jerusalem of old to a neglected infant, his simile is conveyed in these words: "In the day thou wast born thy navel was not cut." This inspired writer flourished about the year of the world 3350, or nearly two hundred years before the time of Hippocrates, and six hundred before the Christian æra.

‡ Synopsis of Difficult Parturition, p. 21. Here one joint of the little finger was included in the ligature, and cut off.

§ See Introduction to Midwifery, chap. viii. sect. 9, where the case is hinted at, though not detailed. Smellie (Coll. xxii., number iii., case 3,) mentions having himself cut the funis between the single ligature and the umbilicus of the child, to its imminent danger, which could scarcely have happened had he done it by the aid of the eye.

be impossible for an accident of this disastrous kind to happen, if we protect the child's body as just recommended; for should it throw a limb into the very jaws of the scissors at the moment we are about to close them, we shall feel the stroke upon our hand, and become conscious of the chance of injury.

Generally, the infant cries strongly as soon as it is born, and in such case the ligatures may be applied immediately. It was once the custom to tie the funis directly the child was in the world, whether breathing had commenced or not; under such management, no doubt, many were lost. Hippocrates,* speaking of a fœtus that has passed with difficulty, or been extracted by art, counsels us not to separate it from the mother until it had either passed urine, sneezed, or cried aloud; or, in other words, until strong assurance was afforded of its having assumed some of the functions belonging to breathing life. White† and Denman‡ recommend that we should not put a ligature on the funis until after the circulation through the umbilical vessels has ceased.§ Of these instructions, that by Hippocrates is by far the best. There is no necessity to wait until the umbilical vessels have ceased to pulsate; because the same changes will take place in the arterial system of the child, whether the circulation in the funis is interrupted rapidly, or whether it occurs more slowly, and by degrees; and the infant can derive no benefit from a continuance of the circulation through the cord after it has breathed freely, nor indeed after the placenta is separated from its uterine attachment. Denman tells us, "In the course of ten or twenty minutes, or sometimes longer," the pulsation in the funis has entirely ceased. I am inclined to think it would generally be much longer; but this is mere speculation, as I have no experience on the subject; for I never delay the application of the ligature until the pulsation has ceased spontaneously. It appears to me, indeed, by such a practice we should be unnecessarily keeping the child in a very awkward, not to say dangerous situation, and subjecting the mother also to considerable additional inconvenience. The rule I would lay down for the guidance of the student is nearly that directed by Hippocrates. I would recommend him not to put the ligature round the funis until the child has cried, or given some other unequivocal evidence of the proper change having taken place in the function of the lungs; unless, indeed, it be born with animation suspended, and he is desirous of using the warm bath, inflation of the lungs, and other resuscitating means, as speedily as possible.*

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* De Superfœtatione, caput 5. I do not quote Hippocrates as an obstetric authority; but his remark is valuable, as showing the practice of his time.

† Treatise on Lying-in Women, third edition, 1785, Appendix, p. 372.

‡ Chap. ix. sect. 9.

§ Paré (Johnson's translation), book xxiv. chap. 17, says, it is very wrong to tie the funis, until after the placenta is born.

On the child being separated, it must be handed to a careful attendant; and we must be watchful that its mouth and nostrils are not so covered as to impede the ingress of air into its lungs—an accident not unlikely to happen from the too zealous attention of its new protectress, to prevent its taking cold.

The infant being carefully disposed of, we must pass our hand upon the patient's abdomen, before we leave our seat, for the purpose of ascertaining whether there be a second child or not; and whether the placenta is still retained within the uterus, or has escaped into the vaginal cavity.

If the uterus contain another fœtus, its fundus will be felt high up, above the umbilicus, and its general bulk will be almost as great as it was before the expulsion of the first. We shall be able to define it distinctly; it will present that peculiar elasticity, and that degree of subdued fluctuation, which are so characteristic of the gravid uterus towards the close of pregnancy. But if there is no other child in the cavity, we shall find the womb in one of the following five conditions: First, it may be almost as small and hard as a fœtal head, so that we can grasp its body completely; and it feels nearly as solid as a cricket-ball. Secondly, it may be almost equally small, but softer; so that when we press it, it *gives* under our hand, and has somewhat of a doughy feel. Thirdly, it may be about the same size, but one minute hard and the next soft. Fourthly, it may be almost as large as an adult head, and so hard that we can perfectly define it with the hand; it bears the character of a large, solid tumour. And, fifthly, it may be as large as an adult head, and soft, its general volume not so easily defined, also communicating a doughy sensation to the touch; and when grasped, it becomes harder in substance, and less in bulk.

The three first states announce that the placenta has wholly, or almost wholly, passed into the vaginal cavity, and the two last indicate that it is still in utero; the fourth proves that the uterus is contracted around the mass, and the fifth shows that it has not yet taken on itself the office of contraction, for the purpose of expelling it. Of all these conditions immediately after the child is disposed of, we generally find the last the most prevalent—namely, where the uterus has not yet contracted to expel it; but where we may expect that in a few minutes action will be re-established, under which it will be protruded into the vagina. The woman cannot be considered in a secure state so long as the placenta is retained in the uterus; nor is she to be looked upon as positively safe from hæmorrhage, unless the first of these varieties obtain,—unless the uterus be as small as a fœtal head, and so hard that we can make no impression upon it by our grasp. We may then conclude that the placenta is entirely excluded, and that she is free from the danger of flooding, at any rate for the present: but this state of perfect contraction is seldom met with so soon after the child's birth.

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* See Appendix L.

After having examined the uterus through the parietes of the abdomen, we must make an internal examination, more perfectly to assure ourselves in what way the placenta is disposed of. Twisting the funis umbilicalis around the first two fingers of the left hand, and bringing it gently to its bearing, we pass the first finger of the right hand, previously anointed, into the vagina, as in a common examination. If the placenta be entirely in utero, which, as just remarked, is most commonly the case immediately after the child's expulsion, we shall either not be able to touch it at all, or, if it be within reach, we shall only detect a very small portion of it; we may just feel it offering itself at the os uteri, but we cannot surround its volume, nor can we probably discover the insertion of the funis.

Removal of the Placenta.—There is no part of natural labour which requires so much judgment as the conduct of the third stage; for the slightest mismanagement of the placenta may be productive of most serious mischief, by converting a perfectly natural into a most dangerous and complicated case. As long, then, as the placenta remains in utero, so long we must wait, within a certain limit,—provided there be no flooding—for those contractions which are to expel it from the uterus into the vaginal cavity. The length of time which it is desirable to wait will be particularly specified when the undue retention of this mass is treated of.

Before quitting our post at the patient's bedside, her person must be made as comfortable as circumstances will permit, by the removal of all the wet and soiled napkins, and the application of two or three others, warm and dry, to the hips and vulva. We need not be solicitous about getting the placenta away soon; all pulling or jerking at the funis with this intent must be avoided; but while it remains out of the reach of the finger, provided there be no return of pain, some gentle grasping pressure may be made on the uterine tumour, from the fundus downwards; this will facilitate contraction, and, perhaps, expedite the expulsion of the mass. The amount of pressure must not be such as to produce absolute suffering, but only a comfortable support and a sensation of security. Having withdrawn from the bedside, and paid some little regard to the arrangement of our own dress, we may offer a few words of consolation and congratulation to the patient; make our observations on the pulse; and request that another blanket may be thrown over her, to prevent any rigor or chilly feeling supervening on the violent perspiration she has suffered.

In some countries, and in parts of this kingdom, it is the custom to give the patient a tolerably strong stimulant or cordial, consisting of a glass of warm wine or spirit and water, immediately after the child's birth:* but in London this practice is not generally followed; and I think we act more safely in omitting it, unless faintness or some other cause indicates the necessity. Any mucilaginous or diluent drink may be exhibited, if she be inclined to take it—not warmer, however, than the temperature of the body—and we may assure her, unless there be any contra-indicating symptom, that so far she is safe for the present.

The nurse should be required to devote herself entirely to her mistress until after the placenta has passed, because her services may be necessary; the child need not as yet engage any part of her attention. We may employ ourselves in the patient's room for five or ten minutes, if we choose, or we may withdraw into another; but we must on no account leave the house so long as the after-birth is unexpelled; and we must not be many minutes together absent from the bed-side, lest a sudden attack of hæmorrhage should occur, and the danger be detected only on the supervention of syncope. Our time may be advantageously occupied in looking to the child's safety, and particularly in assuring ourselves of the security of the umbilical vessels.

While we are thus watching, we shall most likely be informed of the return of uterine action, by the woman complaining of two or three comparatively trifling pains affecting the back and loins. As it is probable that under these pains the placenta may have somewhat descended, another examination may then be made *per vaginam,* to satisfy ourselves on this point. Our subsequent conduct must be regulated entirely by the situation in which the placenta may be found. I have already said, that so long as the mass remains perfectly out of the reach of the finger, so long is it completely included within the uterus, and so long no attempt must be made to remove it by traction at the funis. But although we may be positive, if we cannot feel it, that it has not yet descended into the vaginal cavity, we cannot be equally certain, when we detect a portion of it, that it is wholly excluded from the uterus; because part of the edge may appear externally to the os uteri, while the great mass remains within. Neither must we feel satisfied that it is lying loose in the vagina, even although we may be able to distinguish the insertion of the funis easily, as is generally taught and believed, because the placenta may be of a battledore formation (plate 27, fig. 1); and although the root of the cord may be quite within reach, and the division of its vessels perfectly and clearly discernible, yet the principal bulk may be still in utero, and perhaps morbidly adherent to the uterine surface; under which state, if we were to make any forcible attempts to remove it by pulling at the cord, we must necessarily and inevitably produce mischief, and should probably place our patient's life in imminent hazard.

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* Campbell's Mid. p. 198.

Before we can assure ourselves that the placenta is totally excluded from the uterine, and resting in the vaginal cavity, we must be able not only to feel its substance distinctly,—not only clearly to detect the insertion of the cord into its structure, but we must also be able to surround it entirely by the finger, so as to encompass its principal bulk. It may then be withdrawn at pleasure by simple traction at the cord. Should it be found requisite, however, to remove it from the uterus, the agency of the funis must by no means be relied on; but the hand must be introduced completely within the womb, and it must be extracted in the manner to be hereafter particularly detailed.

By some, indeed, we are recommended not to withdraw the placenta, even from the vagina, but to wait for its natural extrusion by the muscular powers of that organ,* under the belief that its continued residence in the canal will stimulate the uterus to more perfect and complete contraction, and thereby further the prevention of hæmorrhage. I can neither coincide with this sentiment nor agree with the practice; because, as already shown, the vagina having been inordinately distended by the head of the child, its fibres will sometimes not recover sufficient tone to contract effectually on the mass for some hours. During this interval the patient's mind is kept in a state of great anxiety, inducing, perhaps, serious distress; since all women are well aware that they cannot be pronounced safe until, at any rate, the afterbirth has come away. Again, so far from considering the continuance of the placenta in the vaginal cavity likely to prevent an immoderate loss of blood, I cannot help thinking that its tendency would be exactly the reverse; for, should more blood than is usual be poured out by the uterine vessels, provided the vagina be free and unoccupied, it will escape externally, give an opportunity for the uterus to contract, and its flow will be both evident to the woman's sensations, and perceptible to the attendants, on an inquiry being instituted: sufficient time will, therefore, be afforded for employing means to insure perfect and permanent contraction of the organ. If, on the contrary, the same disposition existed while the placenta occupied the vagina, by filling up the cavity it would act as a plug, prevent the escape of the blood externally, and cause an accumulation in the uterus: that accumulation will distend the uterine parietes; and in the same degree as this distension takes place, will the vessels be enlarged and their apertures opened. They will, therefore, be pouring out their contained blood in a geometrically increasing ratio, in proportion as the volume of the uterus becomes expanded. A greater quantity of blood is thus lost in a shorter space of time, and the effect is consequently the more dangerous. Besides, the blood being pent up within the uterine cavity, there is no external evidence of the danger that is stealing onward; and the patient might possibly flood to death before it was even discovered that bleeding was going on.

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* See Denman, chap. ix. sect. 10.

No harm can arise from withdrawing the placenta carefully from the vagina by gentle traction at the cord, when it is entirely under the command of the finger, introduced as before recommended; but the greatest possible hazard may be incurred by attempts to bring it away in the same manner before the mass can be clearly, distinctly, and perceptibly defined.

The removal of the placenta from the vagina is easily effected. Twisting the funis umbilicalis two or three times around the first and second finger of the right hand, we draw down in a line tending towards the coccyx, and receive it in the left, placed under the perineum; or we may introduce the two first fingers and the thumb of the left hand into the vagina, embrace the mass between them, squeeze it as we would a sponge, and slowly extract it.

It is not only necessary that we should remove the placenta, but the whole of the membranes also, if possible. Some practitioners are careless about the membranes, their whole attention being directed to getting away the placenta; but unless some management be used, the delicate fœtal involucra are often torn —pieces are left in the uterus, giving rise to many evils—the least of which, perhaps, is the alarm likely to be created by a portion being protruded through the external parts in the shape of a thread, or offering itself across the vulva, like a smooth glistening tumor, retaining behind it a quantity of fluid and coagulated blood some hours or days after the termination of the labour.

Another distressing evil likely to arise from the same cause, is the accession of violent after-pains, induced by the irritation that the presence of a portion of the membranes occasions; and a third, still more dangerous, is fever of a typhoid type, originating in the absorption of the fluids which are entangled within their folds, and which in time become putrid. All these serious inconveniences may be prevented by a careful removal of the membranes.

To obviate the chance of their being torn, some recommend that, as soon as the placenta has passed through the os externum, it should be twisted round two or three times, in such a manner as to bring them away like a cord.* This is scarcely necessary; all that is required being, that we should draw them forth slowly; or carefully work them out with our fingers if there be any difficulty in their extraction.

The placenta and membranes being perfectly freed, we require a basin or some other receptacle to deposit them in, which, for the sake of decency, we cover with a cloth, and again apply the hand over the uterine tumour, to ascertain that the organ is still in a contracted state, and that no bleeding is going on into its cavity. Having perfectly satisfied ourselves on this point, we may a second time take away the napkins soiled with the accumulated discharges, and envelope the lower part of the patient's person in others that are warm and dry. Three will be sufficient; one must be partially slid under the left hip; another may be placed over and around the right hip; and a third carried between the thighs, directly on the vulva. After the patient has been thus made as comfortable as circumstances admit of, the state of the uterus must be again inquired into, by the hand externally applied, before we withdraw from the chamber; and if no relaxation in its parietes has occurred, no increase in its volume, nor any distension of its cavity,—while, at the same time, there is but little sanguineous discharge externally,—we may pronounce her safe for the present from the chance of hæmorrhage; and, if other symptoms correspond, in as favourable a state as could be hoped for.

AFTER TREATMENT.—*Medicine.*—It is the custom of some practitioners to give a large dose of laudanum immediately after delivery, to quiet the system, to lull the excitement, to still the after-pains, and to procure sleep.† I hold this practice, as a principle, to be even more injurious than the exhibition of large doses of stimuli, because, besides acting as a strong stimulus for the moment, opium exercises a powerful narcotic effect afterwards; and by this effect, it must interfere with those proper and indispensable contractions which the uterus is taking on itself, which indeed are evidenced by the after-pains. It is true we can relieve the patient from the annoyance of this suffering; but at the same time that we remove the pain, we are incurring danger; we are cramping nature, by depriving her of the only power she possesses for insuring the woman's continued safety. The same objections, indeed, do not apply to opiates in a small quantity; they are, in minute doses, likely to do good rather than injury, because they may soothe irritability, without interfering with the necessary changes going on in the uterine system. If, then, we can give such doses of opium, and repeat them at such intervals, as will just induce a state of gentle quietude, and yet not suspend the uterine contractions, we shall be rendering the best service in our power. It appears to me, that by the exhibition of four, five, or six minims of laudanum, or a corresponding quantity of any other sedative drug, repeated every four or six hours, we shall be most likely to effect this object. The opiate may be added to a saline draught, containing three or four drachms of the liquor ammoniæ acetatis, with a little camphor mixture, or given in any other suitable vehicle.*

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* Campbell's System of Midwifery, p. 202. Dewees' Mid. par. 486. Ryan's Atlas of Mid. p. 184. Gooch's Compendium, by Skinner, p. 156. Meigs' Obstetrics, 1852, p. 337.

† See Blundell's Obstetricy, by Castle, p. 729; Ryan's Manual, 1828, p. 251; Dewees, par. 494.

Before the house is left, it is right to make another examination of the uterus, through the parietes of the abdomen, to ascertain that it has not become relaxed since the hand was last applied; the napkins, also, under the hips and on the vulva, must be again inspected, that we may assure ourselves no external hæmorrhage is going on. If, upon this examination, we find that the uterus is still as small, and almost as hard as a fœtal head—if the linen be but little soiled—if not more than two or three coagula, the size of a nut, have passed—we need be under no alarm with regard to the state of the patient; so far as hæmorrhage is concerned, she is safe, most probably, for that labour; at any rate, for the present moment. If, on the contrary, we observe a considerable discharge of blood upon the bed—if the uterus be large, soft, and flaccid; or if, on pressure being employed, a coagulum escapes, or a quantity of fluid blood passes, with a gurgling noise, she is then flooding; she must not be left, but will require careful superintendence, probably for many hours.

Presuming, however, that the case is of the more common kind—one in which the uterus is small and contracted, in which there is a slight discharge from the external parts,—the napkins being but partially soiled,—and in which the feelings are comparatively comfortable, we may take our leave, giving instructions to the nurse with regard to her future management, until our next visit; and these instructions should be clear, positive, and definite; for the patient's welfare and comfort so much depend on proper attention being paid her during the next few hours, that nothing should be left to the caprice or prejudice of a nurse. The first injunction to be given is as to the length of time she should be allowed to remain quiet, until her linen is changed, and she is removed from her position. If there be neither hæmorrhage nor faintness, she need not lie longer than an hour, or an hour and a half, from the time the placenta came away. The next must be with regard to the mode of removal. She must not be allowed to get off the bed, either to sit or stand; nor must she of her own accord move hand or foot in the way of exertion; she must have the dress in which she was delivered taken off as quietly as possible; fresh linen placed on her person; and she must be lifted, with the least possible assistance on her part, into the place previously prepared for her.

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* Medicine of any kind may often not be required after delivery; but in many cases it is useful; and in few can even opium do harm, if exhibited in small quantities, unless there exist a peculiar idiosyncrasy of constitution unfavourable to its action. It is as well, then, that something should be ordered;—not simply because it is expected;—not merely because the patient may consider herself neglected if it be omitted, and may attribute any inconvenience she may afterwards suffer to that omission;—but because it tends to keep down excitement, and to induce repose. The old-fashioned spermaceti draught used to be a favourite medicine after labour. (See Denman, chap. xix. Sect. i. Divis. 2.) It was administered under the idea that spermaceti was a specific for inward contusions, and that under labour the neck and mouth of the uterus, and the vagina, were necessarily bruised by the passage of the child. Both the positions, however, on which this practice was founded, are erroneous; neither is spermaceti a specific for inward bruises, nor is it usual for any inward bruising to take place under labour. But spermaceti forms an elegant draught, and is a harmless drug, and there exists no objection, that I am aware of, to its exhibition.

The student will do well to bear all these cautions in his mind; for many women have lost their lives soon after labour, and others have been rendered miserable for the remainder of their existence, through the stupidity, ignorance or obstinacy of the persons surrounding them. Many a woman has died from syncope,*—the mere consequence of being placed in the erect posture, either on her feet or in a chair, while the attendants have been preparing the bed for her reception. In many an instance a sudden and fatal gush of blood has followed the same injudicious proceeding; and I have personally known two cases in which an aggravated procidentia of the uterus occurred, owing to the same cause, which continued as long as the patient lived.

Bandage.—We must not omit to give directions about a bandage, or *safeguard*, as it is usually called, in the idiom of the puerperal chamber. Most frequently, indeed, the medical man's attention is called to the propriety of its application, either by the nurse or the patient herself, so that it seldom becomes necessary for him to give orders respecting it: for women have an idea that the more tightly their persons are braced after delivery, the more likely are they to preserve the symmetry of their form; and this is a point very near their heart. There are few, indeed, who are careless about possessing a good figure; and so long as this prejudice prevails — while the female breast continues to throb with its present passions and desires — so long nothing will be neglected by them to improve those personal graces with which nature, in her prodigality, has enriched them. Some practitioners adapt the bandage themselves, and apply it immediately after the placenta has been removed. I think it preferable in common cases to leave this duty to the nurse; and that it should not be put on until the body-linen of the patient is shifted. Because, in the first place, it appears to me more desirable that perfect quietness should be preserved until the first changes in the uterus consequent upon labour are effected, that no disturbance may interrupt their progress; and in the second, I cannot help thinking that there is something highly indelicate in its being applied by a man,—much more so, indeed, than any of the duties we are ordinarily called upon to perform under natural labour. It is of most service when next the skin: it must be sufficiently broad to reach from the pubes, almost to the ensiform cartilage, and it cannot be properly adapted unless the abdomen be quite uncovered. In addition, I would remark that the nurse must know very little of her duties, if she cannot draw a properly contrived bandage round the person, and give it the due degree of tightness without incurring danger.

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* For a case of instantaneous death after labour, in consequence of the patient's itting up, contrary to her medical attendant's injunctions, see Meigs' Obstetrics, 852, p. 346.

The principal object which the bandage serves is to brace the bowels, and give them an artificial support, in lieu of that which they have lost through the laxity of the abdominal muscles; and to prevent the faintness frequently attendant on the sudden removal of a certain degree of pressure. It may to some extent, indeed, stimulate the uterus to more perfect contraction; but if that organ be unnaturally flaccid, it would be wrong to rely on compression by a bandage, to insure its more powerful action, or prevent its cavity becoming distended with blood;—in such a case, the only safe means of exerting sufficient external pressure is by the grasp of the hand, steadily, and, for some time, unremittingly, applied.

The interval that should be allowed to elapse between the present and our next visit must depend on circumstances;—it should certainly not be deferred beyond twenty-four hours; but it is much better that it should be made within twelve.

There are many points to which our attention must be directed upon this first visit. We must learn whether our patient has been much harassed with pain, and what sleep has been obtained; for sleep, the grand restorer of wearied nature, is especially requisite after labour. It is fortunate if we are informed that she has had two or three refreshing slumbers. We do not expect uninterrupted rest, because she will be disturbed by the after-pains; but if she has not suffered much from this cause of annoyance, and has enjoyed three or four hours' sleep during the first twelve or eighteen hours, we consider that a good average. Of the nurse we require to learn whether any water has passed from the bladder, for that is a matter of great consequence; and what sort of a discharge has issued from the vagina. The sanguineous discharge does not cease as soon as the placenta is expelled, nor ought it to disappear suddenly; but a continual oozing of blood goes on from the uterine vessels, in a greater or less quantity, for some time after delivery. In scientific language, this flow is known by the name of the *lochia;* among women, in general, by that of *discharge;* and by the vulgar it is called *the cleansings.* For some days this discharge continues to possess all the constituent parts of the blood; but it gradually loses the firmer portions and red globules; and before its final departure it becomes of a serous character, possessing a greenish tint; it is then known, in the language of the lying-in room, by the name of the *green waters.* This change in its character and appearance is the result of the continued contraction going on in the uterus. At first, when the uterine parietes are comparatively lax; when the vessels are of large diameter, and their apertures perfectly patulous, all the essentials of the blood are allowed to escape through them; and the discharge is consequently purely sanguineous, mixed, indeed, with the secretions of the vagina and inner surface of the uterus;* but after a time, in proportion as the uterus contracts,—as the vessels are diminished in their calibre,—as the openings through which the blood exudes become smaller, — the fibrine and red globules, by degrees, are prevented escaping, until at last the serum only oozes out, carrying with it the smallest possible quantity of the colouring particles. On any exertion, indeed, being used, and sometimes merely on the first rising from the bed, the discharge may assume a more florid hue, and be more copious than it had been for some time past: unless, however, this be to a debilitating extent, it is not usually necessary to enjoin any stricter confinement in consequence. If, then, on our first visit, we learn that the bladder has acted freely, although, perhaps, with some trifling pain; that the discharge has been sufficient to have required the removal of four or six napkins,—and that a small coagulum or two has also passed: we may consider the action of the pelvic viscera so far to be going on in a healthy manner. We are not to expect that any fæces will have been voided; it is very rarely that the bowels act within the first twenty-four hours after delivery, unless diarrhœa have existed previously to the accession of labour.

After information on these points is obtained, we may require to place our hand on the abdomen, to ascertain whether the uterus is still contracted, and whether pressure upon it gives pain; and we may, at the same time, learn whether the bandage is properly applied. If it has shifted its position up towards the bosom, as it frequently does, we must desire the nurse again to adapt it. We must, of course, make our observations on the tongue, pulse, and countenance: from the appearance of the latter, we shall gain more information than can be described. If the patient looks pale, haggard, anxious, and weary; if her features are shrunk, something is wrong: if, on the contrary, she is placid, — her countenance resuming its natural expression, even although more than usually pallid; while the pulse is seventy or eighty, the tongue and mouth moist and clean, there is every indication of a favourable issue of the case.

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* The lochial discharge is generally classed among the secretions; but this is evidently erroneous, as its principal constituent consists either of blood itself, or the more watery particles of the blood.

It is not right that we should leave the house without taking some notice of the infant. We must learn whether it has passed urine and stools; and should the answer not be satisfactory, we must make a personal examination, that we may early detect any mal-formation which may exist in the rectum or urethra.

We must also direct our attention to the state of the mother's bowels. It is the custom in London to give an aperient draught on the morning of the third day after labour. Castor oil, or a common black-draught, will be found as efficacious as any kind of purgative; they both generally operate speedily and satisfactorily, without causing much pain. The dose should be repeated every four or six hours, till the bowels act; for it is highly desirable that evacuations should be obtained during the course of the third day.

A plan of diet must be laid down for some days to come. Nothing should be allowed but tea, toast, or farinaceous food, until the bowels are freely opened; and after the operation of the laxative, on the same day, a little beef-tea, mutton, or chicken broth, may be given. Such kind of nourishment is all that is required to sustain the system, under any depression that the action of the bowels may have caused.

On the third day, the patient may take for nourishment some solution of animal matter; the next day, or day after, nothing forbidding, she may add to this a light pudding; and in a week she may be allowed a small quantity of solid meat. Stimulants of any kind, unless there be an actual necessity for them, never should be permitted until near the end of a fortnight, and then a glass of wine and water, or mild malt liquor, may be taken.

The temperature of the room must not be overlooked. Even in the midst of summer, the curtains are often found drawn close around the bed, and a fire in the chamber; and when the finger is laid on the pulse, it is observed to be quickened by the application of external heat, while at the same time a profuse perspiration bedews the skin. The curtains should be undrawn, that free ventilation may be permitted, and directions should be given that no larger fire be kept than is required for the purposes of the lying-in room. It is as well to hang a thermometer constantly in the apartment, that the temperature may be regulated every day. Between 62° and 65° will be found the most suitable warmth both in winter and summer.

Till the middle of the last century, it used to be the practice to force a woman's system with spices and cordials, immediately after she was delivered; to prevent her enjoying a single breath of fresh air; to put sand-bags under the chink of the door; to nail the windows round with list; and take every possible precaution to oblige her to breathe over and over again the same vitiated atmosphere. A more sure method of exciting fever could scarcely be devised. In more early times, plasters, fumigations, fomentations, cataplasms, ointments, and oils, mostly composed of stimulating or odoriferous drugs, were applied to the abdomen and vulva, with the view of promoting a free lochial discharge;* and we are told that those women who had the misfortune to be in affluent circumstances, were compelled to submit to the infliction of a sheep's, or, in default of that, a hare's skin, warm and reeking from the carcase of the animal flayed alive, which was placed round the abdomen, to cherish and protect them.† It is not wonderful that inflammatory, typhoid, miliary, and other fevers, were in those days rife; we can only be astonished that, in any case, nature had power to avert the dangers which such an interference with her laws, and subversion of her intentions, must have created.

These observations, however, refer particularly to the middle ages and succeeding years; for the ancients treated puerperal women as though they had suffered some violent and extensive accident, as we learn from the recommendations inculcated by

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* Mauriceau, vol. i. p. 374, 4to edit., 1721.

† Guillemeau. See also Chamberlen's Midwife's Practice, 1665, p. 122. Chapman, in his Treatise on Midwifery, p. 259, strongly recommends this to be done *after a hard labour*. He states that "he has for many years had a happy experience of this method." Dionis, p. 261, (translation,) tells us that Clement applied a fresh sheep's-skin to the Dauphiness of France, after the birth of her first child, "but never afterwards, because it was thought it did more harm than good." Julian Clement was the first man in Europe who was engaged to attend upon a case of labour without the necessity of a surgical operation being anticipated. The case was that of Mdme. de la Valière, the favourite mistress of Louis XIV., and the labour happened in the year 1663. On this occasion the greatest secrecy was observed; the lady was enveloped in a veil; and it is supposed that Louis himself was present in her chamber unknown to the attendants. Clement was afterwards appointed accoucheur to the princesses of France. Ambroise Parè (Johnson's translation, folio, p. 557) advises that the after-birth while warm should be laid to the vulva, especially in the winter; and that in summer, the skin of a wether recently killed should be applied over the abdomen and loins for five or six hours. So that such filthy practices seem to have been very generally followed.

Celsus.* They were confined for a certain number of days to the sparest diet, and severest regimen. Of the two methods, that advised by Celsus must be regarded, on the whole, as most consonant with reason; yet it will be seldom necessary to preserve so much strictness in the treatment of a patient as Celsus has enjoined.

The woman must be kept in the recumbent posture as much as possible, for at least a week. It is better that she should not sit up, even to have the bed arranged, for that time. She may be moved daily from one side of the bed to the other, and lie on each alternately. In this manner she can have the advantage of a change every day. If the bed, however, heats her, or lying on it is very irksome, she may recline for an hour on a sofa, carefully preserving the horizontal posture. The ninth after delivery is looked upon by women as a critical day: many consider that, if they have so far escaped the dangers of the puerperal state, when that day is past they are safe from all the perils of their condition: and some think that however much they may have indulged their appetites before, and although they may have been up for some hours for the two or three preceding days, on that they are bound to fast and keep their bed. Although the prejudice of the ninth being a critical day is founded on error, it is as well to favour it; because it is highly desirable that every woman should be kept in a state of perfect rest, and should submit to be treated strictly as an invalid, at any rate, until that period of time has gone by.

After a week, she may get up, and lie the principal part of the day on a sofa. After a fortnight she may begin to put her feet to the ground, and she may take an occasional walk about the room: but the liberty allowed in this respect must depend very much on the continuance of the lochia. So long as that discharge is flowing at all profusely, the necessary changes going on within the pelvis are by no means perfected; but if it has almost ceased at the end of fourteen or eighteen days, we may suppose that the uterus has nearly re-acquired its small unimpregnated size, and that the parts are pretty well restored to their original tone.

We are expected, in this country, to give our attention both to the mother and her infant during the whole puerperal month; or at least until she has quitted her chamber: it is necessary that a visit should be made daily, until the end of a week; after which time, the attendance may be regulated according to the circumstances of each case. At every visit the state of the bowels must be particularly inquired into, and care must be taken that they act sufficiently. They are usually torpid while the woman is inactive, and it is requisite to repeat the aperient draught, or administer an enema occasionally. The bandage should be tightened, and the vulva sponged daily with warm water, to which a little spirit may be added. After three or four weeks, cold water may be substituted, and the parts may be liberally sluiced with it; especially if the time of year be summer.

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* Lib. vii. cap. 29.

Suckling.—It is not generally that we are asked the question whether a woman should suckle her child or not; or indeed are called upon to interfere. If the patient be well, and she does not mean to suckle, she will not consult her medical man about it, because she knows his advice will go exactly contrary to her intentions: but if she be ill, and cannot, it is then our part to prevent her continuing her fruitless efforts, and to require that a wet nurse should be procured for the child.* Some women are averse from suckling, because of the trouble and confinement it necessarily occasions; but others, on the contrary, regard it as the most grateful and pleasing office they can perform. No one will deny that it is the bounden duty of every woman,—provided she has health and strength and means,—to nurse her own child, in whatever station of life she may be placed. She should forego the pleasures of society, give up the necessity of appearing in public, and waive the etiquette even of a court, if those pleasures, or that etiquette, interfere in any material degree with her duties to her infant. I cannot allow that a physician would be honestly and conscientiously fulfilling the trust reposed in him, who did not, even in the highest grade of society, point out the dangers that may spring from this most natural and engaging employment being abandoned; and I should always think better of that woman's feelings, both towards her husband and her infant, who gave it the advantage of her own breast.

No doubt it is much both to the mother's and child's happiness, comfort, and health, for the process of suckling to go on. Every thinking person will agree that milk, being the nourishment afforded by nature, is much more congenial to the child's wants than any extraneous food; that it is most likely to afford suitable sustenance, and preserve the system in a healthy state. Nor is the function of lactation, indeed, less beneficial to the mother than her infant, although its benefits to her may not be so immediately apparent: for, putting out of the question the more obvious ill effects that may flow from a suppressed secretion,—such as inflammation of the glands of the breast, and consequent suppuration,—many less evident evils are likely to arise, among which may be enumerated congestion of the abdominal and pelvic viscera, and undue determination to the head;—the consequence of that blood which ought to be drained away from the general system by the breast, for the formation of milk, being suddenly thrown into other channels, and upon other organs: so that, independently of the strong natural inclination which would prompt every woman to suckle, the child's safety and her own health should also stimulate her to undertake the gratifying and important office of a nurse. Nevertheless it must be confessed that when a woman declines nursing, although a large supply of milk may have been produced, it is almost always removed, and the secretion ceases, with little general disturbance to the system, and no local inconvenience, beyond what arises from the pain of distension; and that the distress occasioned by the fulness of the breasts seldom lasts more than two or three days. It rarely happens for a milk-abscess to form, if the infant is not put to the breast at all. Inflammation and suppuration of the mammary glands is most likely to arise where suckling is partially and imperfectly performed; the organs being kept in a state of constant excitement, and the ducts never being completely emptied.

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* The time when the infant should be first put to the mother's breast must vary considerably in different cases. If there has been a copious secretion from the mammary glands during the last few weeks of gestation, as sometimes happens, the child should be applied early, as soon indeed as the woman's strength is at all recruited, for it will bring her great relief; but if the breasts are flaccid and empty, a longer time must be allowed to elapse. Generally it is both safe and advantageous for the child to suck within twelve hours.

One of the most frequent causes inducing a woman to decline giving her child the breast, is the existence of sore nipples; and it certainly appears cruel to insist on a continuance of what produces so much pain. But we have means to defend the tender organ; and we can cure the ulceration: and this in itself is seldom of sufficient importance to justify our allowing a mother to put her child away.

Sometimes, however, we find,—especially among the poorer classes,—that women will suckle longer than is desirable for their own strength, and for the health of their infants, under the belief that they are not susceptible of pregnancy so long as the least secretion of milk is kept up by the lacteal glands. To a certain extent this idea is correct; women are undoubtedly not so likely to become pregnant while nursing, as after the cessation of that function, provided they continue to suckle for the period only that nature intended: but if they exceed the just limit, keeping the child at the breast affords them little or no protection. Neither do they in general menstruate while suckling, if they wean their child at the proper time; this, therefore, seems one of Nature's ordinances. But there are many exceptions to this law; and my own experience would establish the belief that if the menses flow regularly during lactation, the woman is equally liable to become impregnated, as if she were not suckling. For this reason, as well as because the milk secreted under such circumstances is almost always both less in quantity and deteriorated in quality, I think it better to recommend such a patient to desist altogether: and certainly it would be unwise to select as a hired wet-nurse a woman whose menses recurred with regularity.

Among the lower orders, indeed, it is not very uncommon to see a woman suckling her last infant till within four or five months of her next confinement, much to the destruction of her health, and the undermining of her bodily powers. Some line, then, must be drawn at which the infant should be weaned; and perhaps, as a general principle, from eleven to thirteen months will be found the most fitting time: for then it requires other nourishment than what the breast affords; and its digestive apparatus will easily assimilate both farinaceous food, and different preparations of animal matter.

Prolonged lactation is, no doubt, also, injurious to the child; and, about the year 1830, Dr. Morton published an ingenious essay, with cases, to prove that children kept at the breast for an undue period, are more liable to some infantile diseases, particularly hydrokephalus, than if they had been taken from it earlier.

OF ANÆSTHESIA IN LABOUR.

In the interval between the appearance of the Second and Third Editions of this work, an entirely new element was introduced into obstetric practice, having for its object no less a boon than the removal of the physical suffering which, ever since the fall of man, has been the fearful attendant upon human parturition. It is chiefly owing to the indefatigable exertions of Professor Simpson, of Edinburgh, that this novel procedure in cases of labour has taken such deep hold as well of the public as of the professional mind; and the mode by which so happy an immunity is sought to be obtained, consists in placing the patient completely under the influence of some anæsthetic vapour exhibited by inhalation.

It was for the avowed purpose of deadening pain during the performance of surgical operations, that the proposal to breathe an intoxicating vapour was first, of late, introduced to the notice of the profession; and there are several claimants for the honour of the discovery. The credit is generally given either to Dr. Morton, a dentist, or Dr. Jackson, a lecturer on chemistry, both residents in Boston, U. S., each of whom, indeed, has taken it to himself. It is doubtful, however, how far either of these gentlemen may be regarded as entitled to this distinction: for the power possessed by some elastic fluids, when respired, of deadening pain, and occasioning transient insensibility, was known and published before the commencement of the present century; and the adaptation of two of them to the purposes of surgical operations was put into practice in America as early as the year 1844, if credit may be given to the detailed statement of Mr. Wells, a dentist at Hartford, Connecticut; whose history of the recent introduction of this new practice carries with it the stamp of truthfulness; and, as far as I know, has never been impeached.*

Be this as it may, the first public trial of the efficacy pertaining to any anæsthetic vapour was made in the Massachusetts Hospital on November 7th, 1846, with the sanction of Dr. Warren, when a thigh was amputated by Dr. Hayward from a young girl who had been rendered insensible by the inhalation of ether.† The experiment was superintended by Morton, and the case is said to have proved perfectly successful. The American newspapers of the day immediately made known the prominent facts attendant upon the operation, coupled with the names of Morton and Jackson as the discoverers of a new and safe method of removing all suffering under the surgeon's hands; and the medical periodicals on this side of the Atlantic were not slow to disseminate the extraordinary and welcome intelligence widely throughout the profession.

It is not surprising that the European surgeons eagerly availed themselves of the advantages thus offered them: an overwhelming fervour of enthusiasm was excited; numerous operations were performed, as well in the United Kingdom‡ as on the Continent, by the assistance of this drug; and the fame of the discovery rapidly spread itself over every class of society.

After its capability of procuring a state of total insensibility had thus been tested in a large number of surgical cases, Dr. Simpson had the courage to employ it under labour. To him is undoubtedly due the credit of endeavouring, by means of stupefying airs, to assuage the pains of parturition; for although many of the older philosophers and surgeons had described, and probably practised, modes of inducing insensibility, both by drugs swallowed and vapours inhaled, during the performance of *surgical operations;* yet is there no trace to be found in any of their writings of the same means being had recourse to for the purpose of alleviating *the pangs of child-birth.*

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* For the history of the application of anæsthetics to surgery, see Appendix B.

† British and Foreign Medical Review, January, 1847, p. 311.

‡ The first operation performed in England with ether was by the late Mr. Liston, in University College Hospital, on December 22nd, 1846. It was the amputation of a thigh. (Med. Gazette, January 1st, 1847, p. 38.)

The first instance in which Dr. Simpson used ether in this way, and with this object, occurred on January 19th, 1847.* The patient had a deformed pelvis, and the professor determined to deliver by *turning*, and extracting by the feet, having first induced anæsthesia, with a view to facilitate the operation.

It is evident, from Dr. Simpson's history of the case,† that this unprecedented treatment was not had recourse to until, by reasoning, he had convinced himself that the experiment was justifiable and feasible. After giving a short account of the particulars, he proceeds in the following words: "The result was most satisfactory and important; for it at once afforded me evidence of the one great fact upon which the whole practice of anæsthesia in midwifery is founded;—it proved, namely, that though the *physical suffering* of the parturient patient could be annulled by the employment of ether-inhalation, yet the *muscular contractions* of the uterus were not interfered with; or, in other words, that labour might go on in its course, although the sensations of pain usually attendant upon it were for the time being altogether abrogated."

Such being the conclusions at which the professor had arrived, it was natural that he should take advantage of every opportunity that presented itself for repeating his experiment. Many cases of its apparently favourable administration under his hands, as well as those of other practitioners, followed each other rapidly in Edinburgh; the medical journals, as might be expected, teemed with essays upon the subject; and the popular daily periodicals of North Britain lauded the new practice as a means by which the heaviest of the primæval curses was to be entirely superseded.

On February 13th, 1847, Dr. Murphy‡ informed the Westminster Medical Society that he had used it in a case of *version*, under a transverse presentation; and other obstetricians in London soon employed it, as well in natural as in operative cases.

In France, Fournier Deschamps delivered a patient by the forceps, after having rendered her insensible by ether, about a week after the first case occurred in Edinburgh;§ and Dubois having employed it in five cases, made an official report, to a certain extent favourable, in the Bulletin de l'Académie.|| He thought "it should be restrained to *a very limited number* of cases, the nature of which ulterior experience will better allow us to determine."¶

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* Provincial Med. Journal, 1847, p. 184. See also Simpson's Anæsthetic Mid. Edinb., 1848, p. 6.

† Loco proximé citato.

‡ Med. Gazette, Feb. 26, 1847, p. 384.

§ Gazette des Hospitaux, Jan. 30th, 1847.

|| Bul. de l'Ac. Roy. de Med. tom. xii. p. 407.

¶ See Lancet, vol. i. 1847, p. 249.

The first instance of which any published account was given in Germany, happened on February 24th, 1847, under the care of Martin, of Jena. It was exhibited while an adherent placenta was being separated from the uterus.* Some time previously to the 8th of May, (on which day he read a paper on the subject, before the Royal Scientific Association of Göttingen), Siebold had employed ether in several cases of natural and artificial delivery.† On June 3rd Grenser, of Leipsic, used ether during delivery by the forceps, and afterwards had recourse to it in many cases both natural and instrumental.‡

The American physicians did not resort to etherization in obstetric practice until the accounts of its administration in Europe had arrived on the other side of the ocean. Dr. Channing, of Harvard University, appears to have been the first to use it in a forceps case on May 5th, 1847.§

Since then, some of the transatlantic physicians have not been behind their European brethren, either in the practice with, or praise of, anæsthetic vapours in obstetric cases. From this remark, however, I must except Dr. Meigs, who, as I shall hereafter have occasion to show, has steadily opposed their use; as well as Dr. Hodge, of the University of Pennsylvania.

In Ireland the profession was more tardy in adopting this innovation on established custom. Dr. Tyler, of Dublin, was the first to deliver under such circumstances, on November 28th, 1847. The case was one of instrumental labour;|| and on November 30th, Dr. Mitchell used chloroform in a case that occurred in the South-Eastern Lying-in Hospital, in which there was hæmorrhage.¶

In November, 1847, indeed, a new impulse was given to the application of anæsthetic agents in obstetric practice, "by the introduction of chloroform as a substitute for sulphuric ether." And for introducing this more manageable drug,—as it is stated to be,—which has now almost entirely superseded ether for anæsthetic purposes, both in surgical and obstetrical practice, we are again indebted to Dr. Simpson.** In a true philosophic spirit, and with

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* Ueber, die Künstliche Anæsthesie bei Geburten. Jena, 1848.

† Med. Gaz. June 11th, 1847, p. 1052.

‡ Ueber Æther-einathmungen Während der Geburt. Leipsig, 1847.

§ Boston Med. Journal, 1847.

|| Simpson's Anæsthetic Midwifery, p. 8. See also his remarks on Superinduction of Anæsthesia in Labour, p. 13, note.

¶ Med. Gaz. Jan. 7th, 1848, p. 38.

** Dr. Simpson states (Account of a New Anæsthetic Agent, p. 6, note) that Mr. Waldie, of Liverpool, first suggested to him the trial of chloroform. See also a letter from Mr. Waldie (Med. Gaz. vol. v. 1847, p. 1153). In a letter dated Bartholomew's Hospital, Feb. 1st, 1847, Mr. S. J. Tracy says, "The above effects are not confined to the vapour of sulphuric ether, but are capable of being produced by the ethers in general, more especially chloric ether." (Med. Gaz. vol. iv., 1847, p. 258.) Mr.

no small risk to health, and even life, he followed the example of some of the older philanthropists, as well as Beddoes and Davy, more near our own times, and himself inhaled many gaseous compounds, which, from their constituents, appeared likely to produce insensibility. He found chloroform not only the most speedy and perfect in its action, but also the most agreeable in flavour, the least irritating in its administration, and the most transient in its effects. He therefore recommended it "as a substitute for sulphuric ether." And so innocuous was it considered, that the phænomena resulting from its administration were exhibited, either from curiosity or sport, at many evening parties in the northern metropolis.*

As might have been anticipated, much discussion, and, indeed, controversy, have arisen respecting the use of anæsthetic vapours during labour;—some practitioners advising their employment in every case, even when perfectly natural; others considering them inadmissible under any circumstances; while others, again, of which I confess myself to be one, regard them as too dangerous to be had recourse to unless in some exceptional instances, and under some particular circumstances.

Those, indeed, who are conscientiously opposed to any procedure which has been ushered before the notice of the profession with such acclamation, and has created such an enthusiastic sensation in the public mind as this new practice has done, must necessarily have a very hard and up-hill work to accomplish in substantiating their opinions, however deeply they may be impressed with the truth of their convictions; for the favourable cases are blazoned abroad with all the eagerness inspired by novelty, and received with all the *éclat* attendant on presumed success; whilst those in which any casualties have occurred are, for the most part, kept back from the eye of the public, so that the particulars concerning them cannot be obtained at all, or, if procured, they must have been sought for at great labour, and collected with much difficulty.†

The halo of enthusiasm that encircled the first burst of the

Jacob Bell mentions in the Pharmaceutical Journal for Feb. 1847, p. 357, note, that "chloric ether" had before that time been tried in some cases with success; and the editor of the Medical Gazette states he had ascertained that this "chloric ether" employed by Mr. Bell was the identical compound recommended by Dr. Simpson. (Med. Gaz. vol. v. 1847, p. 939, note.) The first case in which Dr. Simpson used chloroform, was on November 8th, 1847. (Anæsthetic Midwifery, Edinb. 1848, p. 10.)

* "Its use here has been a common amusement, in drawing-room parties, for the last two or three months." (Dr. Simpson, in his letter to Dr. Meigs, published in Meigs' Treatise on Obstetrics, vide 2nd ed. 1852, p. 370.)

† This is well illustrated by a remark made to me by a professional friend, while attending with him a lady suffering under a very severe attack of puerperal mania, which had supervened on the exhibition of chloroform in her labour, soon after its introduction; and which I had no doubt (nor I believe had he) was entirely to be

proposition to carry a woman through her labour equally unconscious of mental anxiety as of corporeal suffering, so completely blinded the senses, that the profession was for a time scarcely in a position to scrutinize its features, and calmly to weigh its merits.

At first, I fear, we saw too much of the bright side of the picture: the feelings and imagination were allowed to outstrip the judgment; and the glorious anticipations indulged in unfitted the mind, by their dazzling lustre, for patient analytical examination.

But the period has now arrived when, from the facts collected, a dispassionate opinion may be formed; when, the excitement of the novel, bold, and startling idea having passed away, over-zeal may be tempered by discretion, and prejudice corrected by calm, sober, and philosophic reasoning.

Without in the least degree impugning the honest intentions and veracity of those who have written in such a strain of congratulation respecting the delightful results of the anæsthetic practice as applied to obstetrics, it may be permitted us to receive their reports with some caution. We cannot but make great allowance, indeed, for the impulsive style of argument with which the originators and early followers of a new discovery,—calculated as this is, if it stood the test of experience, to work such a revolution in the practice of an important branch of medicine,—would naturally seek to establish and uphold their favourite doctrines.

We must recollect, however, that the question of the exhibition of anæsthetic agents in obstetrics is much more complicated than its relation either to surgery or medicine. For in the latter case we have only to establish that they may be safely used, and that they possess the power of annulling pain; while in their adaptation to parturition we have a much wider field to explore in addition. We must decide also whether, at the same time that they destroy sensibility and paralyse voluntary motion, they do not interfere with those reflex or automatic actions, the perfection of which is necessary to the expulsion of the child; it must indeed have been very doubtful, previously to actual experiment, whether an agent possessing such an influence over the sensorium, might not at the same time entirely suspend uterine contractions. It was for this reason that Simpson selected for his first trial a case in which artificial delivery by *turning* was to be practised, because, according to his mode of reasoning, "it was a matter of no vital

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attributed to the inhalation. "If this case had been quite successful," said my friend, "I should have published it, as the vapour removed all suffering." As it was, nobody but her own immediate family and friends were made acquainted with the sad affair. And I have no doubt, if a correct account of all the cases where chloroform has been used were published, the number in which some mischance has occurred, would be found far from small. "An unfavourable case of midwifery brought about by interference is too serious a thing to publish. The courage of most men is not equal to the task." (Barnes, Lancet, vol. i. 1848, p. 443.)

importance whether the etherization stopped the uterine contractions or not.* Nor must we rest satisfied without assuring ourselves that they are innocuous to the infant; for we must bear in mind that we are called upon in every case submitted to our care to keep guard over the safety of two human beings, the life of each of whom often hangs upon our judgment, while their fate is determined by our practice.

Those who advocate the constant exhibition of anæsthetics during labour, argue:—

1st. That their use is devoid of danger, as well to the child as to the mother.

2ndly. That they do not interfere with, or in any degree diminish those uterine contractions, necessary for the propulsion of the fœtus.

3rdly. That they insure a relaxation of the soft parts, through which the child must pass.

4thly. That they counteract the shock of labour; and

5thly. That the principle of their action is to induce a tranquil and placid sleep, during the continuance of which all painful sensation is abrogated.

Let us examine these five propositions a little in detail; and first with regard to the child. We are not in possession of a sufficient number of facts to enable us to declare positively that anæsthetic vapours respired by a woman in labour *never* act injuriously on her fœtus; and it appears to me that the observation of practitioners in general has not been directed to this point with the attention which it merits. But while we have evidence of the subtlety of their poison; while we know how many drugs, taken by the woman, produce an influence on the system of the fœtus in utero; and while we have medical testimony to prove that under their use the fœtal pulse rises to a very rapid rate,† and even beats too quickly to be counted,‡ we cannot but entertain great fears that the tender organization of the infant must suffer in proportion as the action of its heart is accelerated.

In regard to the danger incurred by the mother, that will depend on a variety of circumstances; — partly the susceptibility, or rather impressibility of her own constitution at the time of the inhalation; partly the quantity of the vapour inhaled; partly the length of time she continues under its influence; but chiefly, perhaps, on the degree of concentration in which it is received into the lungs.

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* Anæsthetic Midwifery, Edinb. 1848, p. 6.

† Dubois relates that in two of his five cases during insensibility the fœtal heart beat 160 strokes in a minute. (Lancet, vol. i. 1847, pp. 247, 248.)

‡ Gream, Remarks on the Employment of Anæsthetic Agents in Mid.: 1848, p. 31. See also Med. Gaz. Sept. 7th, 1848, p. 424. It is but fair, however, to state that on other occasions "the action of the child's heart was found to continue quite unaltered, not the slightest change in its frequency and regularity being detected." (Siebold, Med. Gaz. vol. iv.: 1847, p. 1053.)

The number of deaths that have happened through the employment of these vapours, in surgical operations, some of them in the hands of men familiarised with their exhibition, sufficiently proclaims the peril that every one submitted to their agency must more or less encounter. Indeed, it would seem, that, as with other poisons, in *all* cases where they are administered, death will assuredly take place, provided the dose be carried sufficiently far. But there is this difference between poison received into the system by deglutition and by inhalation, that, in the first instance, its quantity can be accurately limited, and its effects as accurately noted; whereas, in the latter, neither can we, in any case, control satisfactorily the quantity absorbed, nor are time and opportunity afforded us in many, of watching the successive changes which indicate the approach of danger.

Dr. Snow, indeed, who may safely be regarded as an authority on the subject, has divided the action of anæsthetic vapours into five *stages* or "*degrees*," as he prefers to call them.

In the first there exists "a kind of inebriation, which is usually agreeable when induced for curiosity, but is often otherwise, when the patient is about to undergo an operation." Consciousness to surrounding objects remains unimpaired, though the power of vision seems slightly affected, and sensation is so much blunted "that the pain of disease, which is generally due to a morbid increase of the common sensibility, is in many cases removed or relieved according to its intensity." *

In the second degree the mental functions are impaired, but not entirely suspended; consciousness, however, no longer continues correct; and a sort of dreamy state supervenes:—"This degree may be considered analogous to delirium, and to certain states of the patient in hysteria and concussion of the brain; and it corresponds with that condition of an inebriated person, who is *not dead drunk*, but in the state described by the law, as *drunk and incapable*." † It is very transitory, and if the inhalation be suspended, the patient in a very few minutes recovers the perfect possession of the mind. A considerable degree of anæsthesia is induced even in this stage; and sometimes a high amount of mental excitement, that renders the person difficult to manage, shows itself. "This degree cannot, any more than the others, properly be compared to natural sleep, for the patient cannot be roused at any moment to his usual state of mind." ‡

In the third degree all voluntary motion is paralysed; and often a rigid, spasmodic contraction of the muscles of the extremities occurs. The mental faculties are completely in abeyance;—the eyes are most frequently drawn forcibly upwards, and the vessels of the conjunctiva sometimes become injected with red blood. "It does not follow, however, that an operation may always be commenced immediately the narcotism reaches this degree, for anæsthesia is not a necessary part of it."[*]

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* See Med. Gaz. vol. vii. 1848, p. 334 *et seq.*

† Snow, loco proximè citato.

‡ Idem.

The fourth degree brings with it relaxation of the voluntary muscles, together with complete insensibility to external impressions, so that no pain is felt even on the infliction of severe personal injuries. Yet, although reflex movements cannot be excited by touching even the most sensitive part of the frame, still some functions of the spinal cord remain, as the sphincters continue contracted, and according to most of its advocates, the action of the uterus in labour is not materially interfered with. "The breathing is not unfrequently attended with some degree of stertor."[†]

"The fifth degree of narcotism is THE COMMENCEMENT OF DYING."[‡] The breathing first becomes irregular, slow, and difficult, then soon ceases altogether; while the heart usually continues to beat for a short time even after the last breath is drawn.

Such, then, is the account given by Dr. Snow—who must be considered as a decided advocate for the use of anæsthetic vapours—of their effects upon the human being; and it is to be remarked that the different parts of the cerebro-spinal axis appear to be progressively in turn influenced as the narcotism is carried through its different stages. At first the *sensor* and *motor ganglia* are brought under its influence. The function of the *cerebrum* is next arrested, and *coma* supervenes—"a total abolition of consciousness, reducing life to a series of automatic movements." Then the *medulla oblongata* and the *spinal centres* become involved; and lastly the *ganglionic system*, when the action of the heart is arrested, and life can no longer be supported.[§]

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[*] Snow, Med. Gaz. vol. vii. 1848, p. 412.

[†] Idem, p. 413. Dr. Snow remarks, speaking of the fourth degree, "I am bette acquainted with this degree as induced by ether than by chloroform; for with the latter agent the third degree appears to encroach somewhat on this." And in another place, in describing the fourth degree, he says, "It would seem *that the whole nervous centres were paralysed by the vapour*, except the medulla oblongata."

Even Professor Miller, of Edinburgh, who is one of the warmest supporters o anæsthesia, in his "Surgical Experience of Chloroform," says, "I do not hesitate to admit that I have seen patients, by an accidentally undue *protraction* of the application, brought to the very door of death by chloroform."

[‡] Snow, Med. Gaz. vol. vii. 1848, p. 414.

[§] See Dunn's paper, Lancet, May 3rd, 1851, p. 484: "The functions of the encephalic centres are always suspended before those of the spinal marrow, and return before them." (Experiments on Ether, by F. A. Longet: see British and For. Med Rev. April, 1847, p. 571):—Consciousness seems to be lost before the sensibility to

With this detailed statement before us, it is impossible to deny that, however carefully employed, some danger must attend the exhibition of anæsthetic vapours; and no one can contemplate the phenomena induced, when the patient is placed fully under their power, without being impressed with the conviction that the peril had been great and imminent.*

When etherization in labour was first brought before the notice of the profession by Dr. Simpson, he counselled that it should be given "so as rapidly and at once to superinduce its complete and anæsthetic effect," with the view of entirely avoiding, if possible, "the primary stage of exhilaration;" † and he gave the same instructions as well in regard to chloroform as ether. ‡

With such symptoms as those recorded in the note, occasioned by placing the patient fully under the influence of these potent drugs, and with the fact that many deaths had even then occurred from their exhibition, in a paper published in the third edition of this work, I strenuously opposed their introduction into obstetric practice, at least in ordinary cases of labour; conscientiously believing that the hazard incurred was far more than equivalent to the advantage gained; and I should undoubtedly continue to do so in any case, if relief could only be obtained by the supervention of a condition similar to that so graphically pourtrayed by Baron Dubois and Sir John Forbes. It must be kept in mind that, when employed in natural labour, they are not had recourse to for the sake of saving life, nor for the purpose of relieving

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pain." "During recovery, consciousness, which first departed, generally returns first." (Snow, Med. Gaz. vol. iv. 1847, p. 514.)

* "After the inhalation the eyes were blood-shot, the respiration was stertorous, there was a slight frothing at the mouth; the general appearance was like one going into a state of epilepsy." "Eyes more blood-shot than the lady, respiration labouring, every indication of cerebral excitement." From a report of a committee of dentists, at New York, appointed to enquire into the safety of the new practice (Med. Gaz. vol. iv. 1847, p. 173), Baron Dubois gives the following account of the symptoms induced in one of the five patients to whom he gave it experimentally during labour; after stating that she remained for twenty-five minutes unmanageable, while the uterus contracted, he adds: "At this period we witnessed a most curious, instructive, though highly perplexing, phenomenon, ruptures of blood to the head, the face becoming intensely red; the looks were set, the eyes being fixed upwards and outwards; the conjunctiva was congested to that degree that I really could imagine blood upon the point of springing from its surface. The under-lip was hanging, the tongue turgid, and squamous saliva issued from the mouth." (Lancet, vol. i. 1847, p. 248, case 3rd.) Nor is the testimony of Sir John Forbes less alarming. "All the usual phenomena of the deepest sleep supervene almost suddenly, gliding often into the profoundness of sopor, if not absolutely lapsing into coma. The voluntary muscles become suddenly relaxed, the jaw falls, the arms hang down, the eyes roll upwards under the upper lid, the respiration becomes slow and laboured, and the face often becomes either pale or morbidly flushed. The aspect of things is indeed such as can hardly be contemplated for the first time without alarm; the individual seems to the common eye to be sinking into the sleep of death." (British and For. Med. Rev. April, 1847, p. 553.)

† Monthly Journal of Med. Science, Sept. 1847, p. 155.

‡ Med. Gaz. vol. v. 1847, p. 937.

pathological pain dependent on a morbid cause, but merely to remove the physiological pain, which is superadded to a natural and healthy function, and which, except where the case has been protracted much beyond what prudence and proper treatment would permit, seldom or never inflicts any injury upon the system.[*] Simpson[†] has indeed spent considerable ingenuity in attempting to show, from the Tables of Collins, that the longer any patient *remained in pain* under labour, the less chance had she of recovering from her confinement. Thus he tells us, that when the labour lasted only two hours, 1 in 320 women died; when from two to six hours, 1 in 145 died; when from six to twelve, 1 in 80; when from twelve to thirty-six, 1 in 23; and when it was prolonged beyond thirty-six hours, 1 in every 6 perished.

But supposing this calculation to be perfectly correct, the fatal results are by no means to be attributed to the prolongation of the pain, *per se*, but to the lengthened exertion undergone, the continuance of pressure sustained, and the superinduction of exhaustion and febrile action consequent. It cannot be denied that a wonderful immunity from permanent injury attends the pains of labour, severe as they undoubtedly are, and that the system is restored to its usual health with surprising facility; and every one who ponders on this subject must feel convinced that Providence has implanted in the female body power to withstand the bad effects of what would, under other circumstances, no doubt, be productive of disastrous consequences; as, in His goodness, He has infused into the female breast a degree of fortitude which is encountered in no other situation of life, to meet and to bear up against the peculiar trials of the sex.

I grant, to the fullest extent, that it is equally the physician's duty to relieve ordinary pain by all the means in his power, as it is to arrest fever or subdue inflammatory action;—pain being a grea evil, indeed, all animated beings strive to avoid it; this is an instinct implanted in their nature, as strongly as their earnest desire to escape death; yet, pain springing even from a morbid cause, is not to be removed at the expense of safety to life: how much less, then, the physiological pain superadded to labour? The analogy between the sufferings endured in labour, and pain from any other cause, does not hold good, because the first is attendant on a natural and healthy action, while in every other case bodily suffering depends on a diseased or deranged condition of the part affected; and the distress it occasions is generally in proportion to its intensity. Labour, indeed, is the only function of the body that, in the healthy state of the organs concerned, is performed with painful sensation; and seeing this to be the case, it is a legitimate inference that this pain is superadded to that particular function for some specific object, and with some wise intention, deeply as these may be hidden from human cognizance.

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[*] "Neither the violence nor the continuance of parturient pains is productive of injury to the constitution." (Copland, Dict. of Pract. Medicine, vol. viii. p. 484.) "Labour pains are endured without any detriment, and even the most severe ones disappear at once, as if by a charm, directly the child is born." (Siebold, Med. Gaz. vol. ii. 1851, p. 1052.) These quotations must not be taken at their full meaning to each of them the words, *within a certain limit*, should be added.

[†] Monthly Journal of Medical Science, Sept. 1847, p. 164, note. See also "Repor on the Superinduction of Anæsthesia in Natural and Morbid Parturition," p. 10.

It certainly appears to savour somewhat of cruelty for a medical man to oppose the urgent entreaties of a patient, who begs to be relieved of her present suffering, and advances the argument that she knows he has the power of doing so, if he would only use it. Still, however much it may militate against his own interest, it appears to me that his duty to herself, her husband, and her family, would forbid his permitting her to run the least additional risk voluntarily, provided the pains were not more than usually severe, and the labour was progressing with accustomed regularity.

We are told that, although many deaths have happened through the exhibition of anæsthetics, when applied to *surgery*, not one is furnished in the whole range of *obstetric practice*. I wish I could believe in the truth of this assertion; but it by no means follows that, because none have come authentically before the public, therefore none have occurred. The only case of death from chloroform in labour, indeed, published by the attendant surgeon, is one in which the patient had procured the drug and inhaled it of her own accord, against his wish and without his knowledge, during the first stage of labour, while he was in the same house in bed. He was not called to her side until after she was dead.*

A deplorable case of death after, and as I verily believe owing to, the exhibition of chloroform vapour in labour, occurred in the year 1851, a few miles from London. It was the lady's fourth child: she gave birth to the first after a tedious and very painful labour, in consequence of a considerable narrowing in the conjugate diameter of the pelvic brim, which rendered the use of the long forceps necessary. Her medical attendant, nearly related to her by marriage, at her urgent desire, placed her under the influence of chloroform during her second labour; and her recovery was speedy and perfect. She was, of course, delighted with the action of the drug, and desired that it might be exhibited in her third confinement also. By this time, however, some unfortunate results having followed its use, Mr. S. administered it more sparingly than on the former occasion; and she was harassed by pains in the head, vertigo, and wakefulness, for four days after the child's birth. Attributing the distress she then suffered to the insufficiency of the dose, when again pregnant she entreated that, in her labour, it might be given with sufficient freedom to insure its perfect effect. Parturient pains first came on about noon. The chloroform was given at half-past seven p.m., when the os uteri had acquired the diameter of an orange, and the pains had become frequent and strong. Its effects were at first most delightful and tranquillising. After "refreshing sleep," as Mr. S. characterises it (but which, if produced by the drug, I would prefer describing as a state of anæsthetic insensibility), she rose, and bore some moderately strong pains for an hour without a return to the chloroform. It was then resumed, and repeated in frequent half-drachm, or drachm doses—but (excepting once) only when she entreated to have "the delightful chloroform,"—from about ten p.m., till a quarter before twelve; soon after which time the child was born. She instantly expressed much gratitude, and expatiated on the relief afforded her, though she even then "felt wrung" with the severity of her labour. The uterus contracted well, and the patient appeared comfortable. At the end of an hour and a half, however, distressing dyspnœa came on, attended with excessive lividity of the face, and all the signs of extensive engorgement of the lungs and heart. Her respiration became more natural, under the means employed, and in three hours and a half, she lay down to rest. But in half an hour she suddenly arose, with a return of most distressing dyspnœa; this was soon followed by convulsions, and almost immediate death.*

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* Med. Times and Gazette, April 14th, 1855, p. 361.

Both Snow† and Murphy‡ deny that this death was attributable to the chloroform. They state that all the deaths which have occurred when it was used for surgical purposes have been sudden; and that as this lady lived more than five hours after she had ceased to inhale the vapour, therefore it could not be the cause of her dissolution. This is surely arriving at a conclusion a great deal too hastily. We know so little, even now, of the laws regulating the action of anæsthetic vapours, that it is going too far to deny the possibility of their impressing the system with a fatal effect, because death was not sudden and instantaneous. It appears to me far from sound logic to argue that, because the vapour is disentangled from the blood and thrown off from the system rapidly after the inhalation has ceased, therefore its influence upon the constitution must immediately cease also. It is quite possible that morbid actions may be set up through its agency, which may continue long after the whole quantity received into the body has been separated and exhaled; as inflammatory action, once excited, may persist long after the cause that produced it has been removed. In my own mind this opinion is strengthened by a fatal case of a very similar nature, which Murphy[*] details as having occurred in his own practice. It was the lady's first child. "The dilatation of the uterus was completed at ten a.m.: as soon as the head entered the pelvis chloroform was exhibited; the severity of the pains were greatly mitigated; she remained quite unconscious throughout, and was delivered in two hours. When the placenta was expelled she fell asleep; on awakening two hours afterwards, she was seized with slight cough, and some difficulty of breathing; the means used gave no relief, and in the evening dyspnœa had so much increased, that she was cupped at the back of the neck to ten ounces. This gave sufficient ease to cause sleep for about two hours, but when she awoke the dyspnœa returned with still greater distress, and continued to increase during the night. On the following morning she became asphyxiated, and died about two o'clock p.m." These two cases in many of their features are very much alike; and, notwithstanding what is advanced to the contrary, I cannot but attribute the fatal consequences, in both, to the agency of the anæsthetic vapour. Murphy, indeed, accounts for it in his case by the presence of an extensive disease of the kidney, which was discovered on *post-mortem* inspection; and suggests whether this dyspnœa was not a form of puerperal convulsions repressed and kept under by the action of chloroform? In my estimation there is not the least ground for such a supposition; nor can I trace any connexion between the disease and the symptoms it is presumed to have occasioned. Murphy[†] says, "these are not the only instances of fatal dyspnœa after labour, from other causes than chloroform." I have seen some cases of very distressing dyspnœa *during* labour, where there has been disease of the heart, or hydrothorax; but in them the alarming symptoms came on before the child's birth. I never in my experience met with a case similar to either of these that I have just related; nor did one such occur among the 68,435 patients of the Royal Maternity Charity, delivered under my father's and my own superintendence, of whose labours accurate records were preserved. I think these cases should convince us that the effect upon the system does not always terminate with the cessation of the use of the vapour; but that its baneful influence may persist, and remain in operation, long after its exhibition is discontinued.

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* I think it right to state that the caution, skill, and experience of the gentleman who superintended this case are above question. The facts I have given were kindly communicated to me by himself, and I have his permission to publish them.

† Association Med. Journ. June 10th, 1853, p. 500.

‡ Chloroform in Childbirth, 1855, p. 61.

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[*] Lectures on the Principles and Practice of Midwifery, p. 474.

[†] Chloroform in Childbirth, 1855, p. 62.

Murphy, on the contrary, "believes that death by chloroform *only* occurs when the patient is under its full influence;" * and he asks, "how could the absent vapour cause a distressing dyspnœa, when its presence did not disturb the respiration?" As well might we ask, how the absent marsh miasm could cause ague in a person who had been exposed to its power two or three days before? But Murphy argues that the blood is not poisoned. He says the vapour does not dissolve in the blood, as is the case with alcohol; † that it does not combine with or alter it, or make any change in its properties. He asserts that "a large proportion of free chloroform travels through the circulation;" yet in the same page he admits "that the blood is the channel through which it exhibits its phenomena." ‡ I cannot reconcile these two statements, nor is it easy to believe that the vapour circulates through the body *in the form of vapour;* it must be taken up by the blood, it must combine with it at any rate, if it is not dissolved in it. There is no doubt that it is thrown off from the blood rapidly; and this rapidity of its separation seems to be the only reason,—certainly a very inconclusive one,—for the assertion made by Dr. Murphy. Again he inquires, "if such be its effect *after* inhalation, how is it that we cannot find a single instance of death so produced in the thousands who have been under its influence for surgical operations?" This may be answered by the peculiar condition of the system of the parturient woman. It is more susceptible than at any other time; consequently, it may be open to impressions which would not produce the same effects under any other circumstances.

By a little attention to the action of chloroform on the animal body, we may determine, whether it is to be regarded as of a poisonous nature or not. We know that if blood charged with too much carbon is thrown upon the brain, an anæsthetic effect is produced. The superabundant carbon ought to be thrown off from the system in the lungs, by its combination with the oxygen existing in the atmospheric air, that is received into the air-cells. Under this combination, carbonic acid gas is generated. § But chloroform has itself so strong an affinity for oxygen, that it robs the atmospheric air in the lungs of a great part of the oxygen which it contains; by which means the carbon cannot be converted into carbonic acid, and consequently, cannot be expelled from the system.* It therefore circulates in the arteries with the blood. Now blood that contains an undue quantity of carbon is unfit for the ordinary purposes of life, and is regarded as *poisoned;* this poisoned blood is thrown upon the brain, and hence intellectual insensibility is induced, together with the loss of physical sensation. It matters not whether the poison that circulates with the blood is introduced *ab externo,* or whether it originates in our own body, and is accidentally retained; its effects must be precisely the same in either case. Nor does it signify through what agency the blood is prevented from becoming decarbonized. The insensibility and loss of muscular power that takes place previously to death in drowning is owing to the same cause. Extreme cold also becomes an anæsthetic in a similar manner. Under exposure to a very low temperature, less carbonic acid is exhaled through the pulmonary system, than the health of the body requires; torpor then first occurs, inability to move succeeds, afterwards insensibility to external objects as well as to painful sensation, and death finally results. The blood is vitiated, if by any means the poison elaborated in the system is not got rid of through the beautiful machinery constructed by nature for that especial purpose. It has been ordained that a certain proportion of carbon should be separated from the body, and expired in the form of carbonic acid gas, through the lungs. This cannot be effected if the chloroform appropriates to itself the oxygen it meets with in the air-cells; consequently, the blood circulates through the body charged with the poison of carbon. We are then surely warranted in saying that the blood is actually poisoned by the agency of the anæsthetic vapours.†

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* Chloroform in Childbirth, 1855, p. 63. † Idem, p. 13. ‡ Idem, p. 11.

§ Whether we adopt the theory advanced in the text, or choose that now more generally received, that the carbonic acid *is formed in the system,* and *thrown off from the lungs,* oxygen being absorbed by the blood instead, my argument holds equally good; because if the chloroform in the air-cells robs the air of the oxygen that ought to be taken up, the proper change cannot take place, and all the bad effects resulting from the circulation of carbonized blood are produced.

But are there no less evils than actual loss of life likely to result also from the use of these drugs? It is the opinion of no few observant practitioners that puerperal mania is eminently to be dreaded;‡ and I have seen three cases myself in which I have no doubt that this terrible disease was induced by their agency.[*]

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* The affinity of chloroform for oxygen is so great, that phosphorus is prevented becoming luminous, if the vapour of the drug be mixed with the air.

† Other ternary compounds, besides chloroform, in which carbon and hydrogen form the base, possess, as is well known, anæsthetic properties; for instance, sulphuric ether and alcohol, in which they are combined with oxygen; and hydrocyanic acid, where nitrogen is the third ingredient. This third element, though not essential, seems to regulate the potency of their action; and with nitrogen they are most powerful, with oxygen least so. Carbon is, however, the really effective agent in these compounds, and is called into various degrees of activity by the gases in combination with it. This is proved not only by what is advanced in the text, but also by the fact that chloride of carbon, into the composition of which hydrogen does not enter, is also anæsthetic in its effects.

‡ See Gream's Misapplication of Anæsthesia in Childbirth, p. 66. Mr. Banner (Med. Gaz. vol. viii. p. 565) mentions a case where chloroform had been administered during a first labour, for several hours. The patient, after recovering from its primary effects, became delirious, and continued in that state during the day and

Moreover, there is good reason to believe that paralysis[†] has been induced by anæsthetic vapours; and puerperal convulsions is another frightful occurrence that I should dread, in consequence of the frequent supervention of convulsive seizures, where anæsthetics have been used for surgical purposes, and the great susceptibility to external impressions that exists in the nervous system of every pregnant female. Thus, Snow[‡] says, that hysterical patients, as soon as they lose their consciousness from the effects of the vapour, are sometimes attacked with a paroxysm of hysteria. Simpson also acknowledges, in his letter to Meigs, that hysterical fits are frequent when it is given in labour.[§]

Snow again states, that persons subject to epilepsy are liable *to have a fit brought on* by inhaling ether or chloroform.[||] The

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chief part of the night. Dr. Sutherland, at the meeting of the Roy. Med. Chirurg. Soc., held on April 22nd, 1851, stated that he had seen three cases of puerperal mania resulting from the use of chloroform in labour. (Lancet, May 3rd, p. 454.)

[*] One of these patients, when I saw her, four or five days after her delivery, could not be persuaded to utter a word in answer to questions, except "Oh! that chloroform—take away that chloroform—I can't get rid of the smell of that chloroform!" And this she was constantly repeating: certainly no positive proof that the chloroform had occasioned the maniacal symptoms; but it appears to me to carry with it a strong presumption in favour of that supposition.

[†] Dr. Haartman, a Russian physician, in a communication to Dr. Simpson (Anæsthetic Mid. p. 37), states "That while he was house-surgeon to the Westminster Lying-in Hospital, he exhibited chloroform in twenty-five cases. One of these patients, after complaining of head-ache, was attacked on the eighth day from her delivery with *apoplexia nervosa,* after which she got paralytic on the right side. By the aid of strengthening medicines she began to walk in about a month." Can anybody who is not wedded to the practice of etherization doubt that this hæmiplegic condition, which deprived the patient of the use of her limbs *completely* for a month, and *partially* for how long after we are not told, was the result of the inhalation? Simpson, indeed, thinks that the puerperal paralysis was in this, as he says it is in most other cases, probably connected with albuminuria; and he mentions two patients he had under his care who were in previous labours attacked with hæmiplegia, one "at the time of her delivery," the other "immediately after the birth of her first child." I have attended women in labour who were paralytic, having been attacked with apoplexy issuing in that affection, some time before; but of the vast number of patients with whom I have been concerned in labour, I do not recollect a single instance of hæmiplegia occurring within the month after delivery; so that my experience would teach me that such a case is exceedingly rare.

In one of Dubois' five cases, (Lancet, vol. i. 1847, p. 247 *et seq.*) numbness of the fingers, and in another the same condition of the legs, supervened, and had not entirely subsided at the end of twenty-four hours. If carried a little farther or continued a little longer, would not this have resulted in paralysis?

[‡] Med. Gaz. vol. vii. 1848, p. 1022.

[§] "Not unfrequently spasms, rigidity, &c. come on, but they disappear as the effect increases; and none of us care for them any more than for hysteric symptoms. They do not leave any bad effect; but the mere appearance of them is enough to terrify a beginner." (Simpson to Meigs, Obstetrics, 1852, p. 370.)

[||] Loco prox. citato. He gives the case of a man who was suffering from *delirium cum tremore,* that supervened on a diseased state of the kidneys, accompanied by albuminous urine, and who had suffered from convulsions previously. This occurrence of spasmodic twitchings, powerful, irregular, and uncontrollable movements of the person, and violent convulsion fits during the second or third degree of narcotism, are so common that they are noted by every writer on the subject of anæsthesia. Moreover, in those predisposed to convulsions, *fits may be absolutely brought on at pleasure* by the inhalation of these vapours. M. Fix, a surgeon in the French army, gives very strong testimony as to the effect of chloroform occasioning a fit of epilepsy in those who are disposed to that terrible disease, when he says, "In a true epileptic, *a fit may be brought on at any time by means of chloroform.*" "In simulated epilepsy, this agent produces only its anæsthetic and relaxing effects." "Ether and chloroform administered during a fit, singularly augment its duration and intensity." "From a series of experiments made at the Bicêtre, it has been demonstrated, that by ether inhalations a fit of epilepsy *may be induced at will*, in those liable to them; and that *chloroform brings it on still more rapidly.*"*

Baron Dubois, in the following sentence, forcibly points to the likelihood of anæsthetic vapours bringing on an attack of convulsions in labour: "Now if, through life, we look for a physiological condition, in which there may exist a predisposition to phenomena of that kind [convulsive seizures], we shall find that pregnancy itself but too commonly predisposes women to that sort of nervous excitement which is sometimes carried so far as to be fatal to them. I allude to the fact of puerperal convulsions."†

Of eighty-eight patients in the Maternity Hospital at Edinburgh, delivered under chloroform, without instrumental or manual assistance, one died of convulsions, which came on five hours after delivery, and proved fatal in six days. An attempt is made to account for this attack, by the explanation that "the

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man became the subject of violent convulsive seizures immediately the vapour began to take effect.

* Gream's Remarks on the Employment of Anæsthetic Agents in Midwifery, p. 15, to which pamphlet I would refer for authorities to prove the frequent accession of convulsions under the action of the ethers. Montgomery tells us, that "in several instances the exhibition of chloroform has been followed by symptoms of a convulsive character, and in some, by actual convulsions." (Objections to the Indiscriminate Use of Anæsthetic Agents in Midwifery.) Mr. Banner (Med. Gaz. vol. viii. 1849,) gives two cases in which violent convulsions came on whilst chloroform was being administered previously to surgical operations. And Dr. Hayward says, that "a woman was thrown into violent convulsions after inhaling chloroform, which continued three or four days." (American Journal of Med. Sciences, July, 1850.) Instances of a like nature are reported by almost every observer of the effects of this potent medicine.

† Nevins (Med. Gaz. vol. vi. 1848, p. 381,) says, from the reports made to him, it appeared that convulsions were very frequent after etherization, and that he used the term *very* advisedly. He adds, that "it was sometimes supposed they only occurred before the full effect of the chloroform had been produced; but in many of the reports it was distinctly specified, the 'patient was fully under its influence;' and this had been the case in his own instance."

kidneys were found to have undergone, *in some parts*, the true stearoid degeneration."* I think it may be attributed, with much more truth and justice, to the deleterious agency of the drug.

We cannot be surprised at the supervention of any of the diseases of the class *neuroses*, after a patient has been completely narcotized by this vapour, when we reflect on the intense disturbance that it must create in the nervous centres, and the congestion which the brain must suffer, if such phenomena are superinduced as those which Baron Dubois himself witnessed and has recorded. †

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* Simpson's Anæsthetic Midwifery, p. 21, Note.

† Two of Dubois' five patients died of metro-peritonitis. This fatal disease has, it would seem, supervened in no few cases where anæsthetic agents have been administered; for Dr. Simpson tells us that puerperal fever—which I take to be identical with the Baron's *metro-peritonitis*—carried off two of his own patients who had inhaled ether in their labours. (Anæsthet. Mid. p. 13.) One of these was attacked with convulsions "some days after delivery, which recurred several times. Fatal febrile symptoms then set in, with tympanitis and excessive diarrhœa." It is but right, however, to state that the Professor affirms, "The previous employment of anæsthesia in these cases had nothing to do with the distressing results;" for that puerperal fever swept fatally over Edinburgh during December, 1847, and January, 1848; and that some practitioners in the neighbourhood who were not using chloroform were much more unfortunate than he was. Besides these deaths, Dr. Simpson, writing in 1848, says one of his patients had a short attack of peritonitis, requiring leeches, &c.: that the recovery of another was retarded by the disease described by Marshall Hall as intestinal irritation, and that of a third by an attack of jaundice, that came on two or three weeks subsequently to delivery. I know well how difficult it is in medicine to distinguish between the *post hoc* and the *propter hoc;* but when we read of a woman being "anæsthetized for four or five hours before delivery," as one of these patients was, it is surely fair to infer that the drug had more to do with the production of these fatal events than the Professor seems to imagine. And this especially, since the effect of the anæsthetic vapours being to produce a congested state of the capillaries, it appears not unreasonable to suppose that it might lead to the congestion of the smaller vessels of the uterus, in itself a formidable disease, and one of the varieties to which the generic term "puerperal fever" has been applied. Mr. Banner gives a case (Med. Gaz. vol. viii. 1849, p. 565) of a lady who was delivered of her first child under chloroform. In a short time she became restless; this excitement in an hour ran on to delirium, approximating delirium tremens. This lasted three hours. On the third day peritonitis ensued, and on the fifth she died.

Again, Dr. Paton, of Dundee (Anæsthetic Mid. p. 31,) reports that the new practice had not found favour in that town, in consequence of the deaths of two ladies, in a respectable rank of life, from "puerperal fever," which was epidemic at the time.

From Dr. Simpson's statement of the practice in the Maternity Hospital at Edinburgh, (Anæsthetic Mid. p. 21, note,) we learn that out of the first ninety-five women delivered under chloroform in that institution, three died,—one under convulsions, which I have mentioned elsewhere (the delivery being natural),—one of sloughing of the maternal passages, after delivery by the long forceps,—the other from rupture of the uterus under *version*. There were seven cases of artificial delivery; three forceps, and four in which *version* was performed. This must be looked upon as *a very large proportion* both of operative cases and of deaths. May not the necessity for operative interference, if not the deaths, be ascribed in some measure to the use of the anæsthetic? Yet in the face of these casualties we are assured by Dr. Duncan and Mr. Norris, the house-surgeons at the time, and the gentlemen who drew up the report from which the above abridgment is taken, that "on the whole the results of anæsthetic midwifery, as observed by them in the hospital, *were perfectly satisfactory*."

Had such results followed any particular practice in a charity under my super-

Murphy* ridicules the idea of such attacks ever being the consequence of the action of anæsthetics; he taunts those who object to their use in obstetric practice, with attributing whatever accidents might occur in any labour, where chloroform had been used, to the agency of that drug; "as if these complications were never heard of until this so-called destructive vapour was introduced." This is an unfair way of dealing with the question: the objectors do not attribute every complication that may occur in labour to the drug; but they believe that there are some casualties, to which women are *eminently* liable, as well during as after labour, which this drug is *eminently* calculated to excite. He goes on to say, "as for insanity, epilepsy, &c., these are found *exclusively* in obstetric reports." I have shown just now that at least epilepsy is not found *exclusively* in obstetric reports; and should explain such a fact in regard to puerperal mania, by the great susceptibility of the nervous system of the parturient woman.

Cases are recorded of puerperal convulsions cured by chloroform; and therefore, we are told, they cannot be occasioned by it. That a profound state of narcotism, under which the muscular system is paralysed, will put a stop to the convulsive spasms, there is no doubt; but it must be recollected that this spasmodic muscular excitement does not constitute the disease; it is merely a symptom indicating the state of the nervous system then existing. Until it is proved that anæsthetic inhalations will remedy the congestion that occasions the convulsive action, I would neither admit that they will cure the disease, nor will I be persuaded that they may not produce it.

But we are told that no small degree of alleviation to the pains of labour may be procured without placing the patient so completely under the influence of the anæsthetic as we were taught to believe necessary on its first introduction.†

The trials which I have made with chloroform would lead me to confirm this statement to a very considerable extent. Sensibility may be greatly blunted without entirely destroying consciousness; and thus a soothing effect may be obtained, while the integrity of the mind is preserved tolerably perfect. So that, when intrusted to judicious hands, considerable advantage may possibly be gained with less peril than attended on the practice originally adopted.

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intendence, I should have regarded them not only as *not perfectly satisfactory*, but as *very unfortunate;* and if this is to be taken as a fair specimen of the cases treated by etherization, I have no hesitation in saying that the drug ought never to be introduced, except on some very rare occasions, into the puerperal chamber.

[*] Chloroform in Childbirth, 1855, p. 3.

[†] "It is quite possible so to regulate the dose as to affect the sentient nerves only, and not the rest; pain may be relieved, if not removed, and the intellect remain undisturbed."—(Murphy, Chloroform in Childbirth, 1855, p. 51.)

Here, however, we are met *in limine* by a serious obstacle; for although we freely concede the position that we may annul or materially diminish the sufferings of labour-throes by a smaller amount of anæsthetic influence than is necessary in the operations of surgery, can we be always sure that we can stay our hand just at that point where we desire to rest,—just where a certain quantity is introduced into the system,—just where a certain effect is produced upon the patient? Of this I have very great doubts; and more especially in regard to chloroform than sulphuric ether. All acknowledge the rapidity of the action of chloroform,[*] and the perfection to which the narcotic effect has been carried, without the supervention of the ordinary premonitory symptoms. The deaths of Mr. Badger,[†] Hannah Greener,[‡] Mad. Labruin,[§] and others were very rapid; not more than two or three minutes intervening between the commencement of the inhalation and the moment of dissolution. When such examples are before our eyes, of the awful suddenness with which death has sometimes stepped upon the scene, it is impossible for us to calculate, with the remotest expectation of certainty, that the different degrees of narcotism, as laid down by Dr. Snow, will appear in their progressive stages; for, in any case that we may be superintending, the last fatal blow may have been struck without any intimation of the proximity of that abyss into which the patient is thus being instantaneously hurled.*

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[*] "The constitution is quickly brought under its influence, even to a narcotism that may be fatal, but it rapidly recovers itself when the vapour is withdrawn." (Murphy on Chloroform in Mid. p. 35.) "The syncope of chloroform is fatal, and if too concentrated a dose be inhaled, the excess of free chloroform may be so great as at once to paralyse the heart." (Idem, p. 34.) "All the deaths caused by chloroform were sudden, and happened when the patient was completely narcotized by the vapour." (Idem, p. 32.) "I have seen a strong person rendered completely insensible by six or seven inspirations of thirty drops of chloroform." (Simpson, New Anæsthetic Agent, p. 8.) "Without proper precautions, the inhalation of chloroform is undoubtedly attended with danger, on account of the rapidity of its action, when not sufficiently diluted with air." (Snow, Med. Gaz. vol. vii. 1848, p. 841.) M. Valleix, physician to the Hôtel Dieu, says, "Ether and chloroform produce exactly the same phenomena, only that the latter acts with an incomparably greater, sometimes an extreme rapidity." (Med. Gaz. vol. vii. 1848, p. 305.) "I inhaled the vapour of chloroform, half a drachm being poured upon a handkerchief, and held to my nose. Insensibility took place in a few seconds; and I was so completely *dead* [*sic*] this time, that I was not in the slightest degree aware of anything that took place. The subsequent stupefying effects of the chloroform went off more rapidly than those of ether, and I was perfectly well, and able again for my work in a few minutes." (Simpson, New Anæsthetic Agent, p. 11, Note. In an account given to him by a young dentist who had two teeth extracted, one under the influence of ether, the other of chloroform.) In addition to this testimony Dr. Hislop (Med. Gaz. vol. viii. 1849, p. 1035) gives a case in which no more than one second elapsed from the time when the inhaler was adjusted, to that when the woman was rendered completely insensible. In this instance there were only thirty minims placed in the sponge of the instrument.

[†] See Lancet, vol. ii. 1848, p. 47. [‡] Idem, vol. i. 1848, p. 162.

[§] This occurred at Langres, in France, on August 23rd, 1849; she died "as if she had been struck by lightning." Chloroform was exhibited previously to the extraction of a tooth, and only fifteen grains were used. (L'Union Médicale, Sept. 8; see also Gazette Médicale, Oct. 20th, 1849.) In the 9th vol. of Med. Gazette, 1849, p. 1007, there is a notice of the death of a young girl, near Shrewsbury, who inhaled chloroform previously to having an operation performed upon the eye. It had, however, such an effect upon her, that she expired instantaneously, as if she had swallowed prussic acid. She seems to have been actually speaking in the Welch

Murphy† indeed affirms that if the vapour be inhaled in a dangerous state of concentration, spasm of the glottis must occur, attended by a sense of suffocation, and resistance on the part of the patient; and leaves it to be inferred that if this does not take place, no hazard is to be apprehended; so that sufficient warning is always afforded us. Did this test hold good universally, the peril of the administration would be much lessened; but unfortunately the sudden manner in which some of the deaths have occurred, without being preceded by spasm or struggling, precludes the possibility of our placing such reliance upon it, as would be necessary for its establishment as a rule of practice.

There is one peculiarity attending the action of chloroform, which greatly adds to the danger of employing it. I allude to its cumulative property, or the fact of its effects increasing after its administration has been discontinued. This has been clearly pointed out by Snow, and admitted by Sibson, Wakley, and others.‡ Snow says§ that it continues to be absorbed for about twenty seconds after the intermission of the inhalation; "which accumulation would be most formidable, if the air taken into the lungs just before were highly charged with vapour." How, then, can we rely upon the assurance, that we may in all instances trace the accession of the different degrees, as distinguished by Dr. Snow? How can we know that this cumulative influence may not be operating, to the destruction of our patient? The vapour is rapidly absorbed, and its poisonous influence over the nervous system rapidly developed; in almost all cases, probably, the effects are as rapidly dissipated by means of the same organs through which it was introduced into the blood. But in some, as

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tongue at the very moment before her death. See also a case of very rapid death in the person of a young lady, previously in good health, under the hands of a dentist, at Berlin, in Med. Gaz. vol. x. 1850, p. 483. There was no disease discovered in any of the viscera. In the Brit. and For. Med. Chirurg. Rev. for Jan. 1852, p. 167, there is a table of twenty-three deaths from anæsthetics; since then I have collected twenty-one in addition.

* "In the succession of effects, during its slow and gradual inhalation, the ganglionic system is the last of the sequence to become involved, and the contraction of the heart the last of the vital actions to be arrested. But the order is reversed when the lungs have been suddenly overcharged with the undiluted vapour; and the patient may die from the direct effects of the chloroform on the heart before insensibility has been produced, and the nervous centres of the encephalon affected." (Dunn's paper, Lancet, May 3, 1851, p. 484.)

† Chloroform in Childbirth, 1855, p. 22.

‡ Med. Gaz. vol. vi. 1848, p. 270.

§ Pamphlet on Fatal Cases of Chloroform, p. 6. See also Med. Gaz. vol. vi. 1848, p. 279; and vol. vii. 1848, p. 841.

the many deaths have fearfully told, they have been persistent, and the "fatal syncope of chloroform" has supervened. Nor can this surprise us, when we learn that one grain of chloroform is expanded into 0·767 of a cubic inch of vapour;[*] and that vapourizable substances pass unchanged into the circulation through the vascular membrane of the lungs, with the same certainty and rapidity as when injected directly into the veins.[†] Again, it seems that the action of this class of medicines is so uncertain and capricious, that the same person is very differently affected by them at different times. Not to mention any other instance, Hannah Greener had been placed with impunity fully under the influence of ether, for surgical purposes, between two and three months before the day on which she fatally inhaled chloroform.[‡]

Nor must we pass over the various degrees of susceptibility evinced by different persons to the power of the drug. This, according to Murphy's statement,[§] is "remarkable," and "would seem to be inversely as the strength of the individual;" so that females, and those the most delicate, would be most easily and most dangerously affected.[||]

Besides what I have already stated, we must also bear in mind that our patient may be the subject of some latent organic disease, which would render the inhalation of an anæsthetic vapour particularly hazardous. Most writers have given it as their opinion, that these means are incompatible with safety, provided the circulating or respiratory organs be in a morbid condition.[¶] Many persons, doubtless, bear about with them organic disease of some of the viscera, without being conscious of the fact. Mr. Badger, although only twenty-two years old, and possessing the florid hue of health, was the subject of great enlargement of the liver, and fatty degeneration of the heart. I know, indeed, this death has been attributed to other cause than that of the action of chloroform,—to mental impression,* but in my judgment without sufficient reason. The simple question to be answered is, whether it is likely this gentleman, in the prime of youth, and apparently in health, would have fallen down dead just before having a tooth extracted, and just after indulging in a jocular remark, if he had not inspired chloroform? †

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[*] Snow, Med. Gaz. vol. vi. 1843, p. 852.

[†] Wagner's Elements of Physiology, 1842, p. 443.

[‡] Med. Gaz. vol. vi. 1848, p. 255. [§] Page 38.

[||] "A casual observer even cannot but fail to remark the opposite effects of chloroform on different individuals of the same age and sex; no experience, however, will enable us to determine beforehand what the precise effects will be." (Clendon on the Use of Chloroform in Dental Surgery, p. 8.) Mr. Nunneley (Med. Gaz. vol. vi. 1848, p. 1093,) says, "Of two animals, apparently in the same condition, the same dose may be given in precisely the same way to both; the one will speedily die, while the other will bear it with impunity." He says also, that, "of all the anæsthetic agents he had tried, *chloroform appeared to be the most deleterious to life.*"

After the statements made in the text, the following sentence, extracted from Dr. Simpson's letter to Dr. Meigs must, I should imagine, occasion surprise at the extraordinary want of precision with which this potent poison has been handled in Edinburgh: "We all judge more by the *effects* than the *quantity*. Generally, I believe, we pour two or three drachms on a handkerchief at once, and more in a minute, if no sufficient effect is produced, and we stop when sonorous respiration begins." (Meigs, Treatise on Obstetrics, p. 370.)

[¶] See Thomas Wakley, jun., in Lancet, vol. i. 1848, p. 25.

It has been argued that, it is "unfair and irrational" to attribute death to the influence of chloroform, when there was discovered, on *post mortem* inspection, such a state of disease of the heart or large vessels, as would render the tenure of life precarious, and probably short.‡ To this doctrine I can by no means subscribe. Disease to a considerable extent may be present, and the patient may still live through many years of enjoyable existence; but if, under such circumstances, chloroform be inhaled, and sudden death occur, how can we do otherwise than attribute the catastrophe to the influence of the drug, as the immediate instrument of dissolution? §

The appearance of the internal organs of animals killed by chloroform has been found to differ exceedingly, in different instances; and this may in a great measure depend on the length of time the individual was subjected to the vapour.‖ Some observers have always met with the lungs highly congested;* others slightly so;† while others report them as perfectly sound.‡ In some cases considerable cerebral congestion has been found; in some the membranes only exhibited that condition;—sometimes serous effusion has taken place into the ventricles, and at the base of the brain;§ occasionally air-bubbles have been seen in the sinuses of the dura mater, as well as in other blood-vessels of the body;‖ and in other cases no part of the cranial contents

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* Snow, Med. Times, August 31st, 1850, p. 230.

† "We have been arguing the question as if the deceased Mr. Badger died from the effects of the vapour. We think, indeed, that the facts speak for themselves, and justify the verdict of the jury. We consider it an irresistible inference from the facts of the case, that but for the use of chloroform, the deceased might now have been living." (Ed. Med. Gaz. vol. vii. 1848, pp. 69, 70.)

‡ See Clendon, Use of Chloroform in Dental Surgery, p. 14.

§ I would refer the reader to the judicious remarks of Dr. Warren, surgeon to Massachusetts Hospital, on the danger of chloroform. (Med. Gaz. vol. viii. 1849, p. 680, and subsequent numbers.) He states it as his opinion, that it is not the quantity inhaled, nor the length of time the inhalation has been kept up, but the *instantaneous nature of the impression* which has occasioned the fatal results. (p. 715.) In this respect he perfectly coincides with Snow, who has attributed death, when it has taken place, to the vapour having been received into the lungs in too highly concentrated a state. He says, (see Med. Times, Aug. 31st, 1850, p. 229,) that, to be breathed with safety, chloroform should be diluted with 95 or 96 per cent. of atmospheric air, while ether will allow so low an admixture as 70 or 80 per cent. Dr. Warren (loco citato, p. 747,) affirms, that the fatal effects of chloroform have, in almost every instance, been produced by small quantities; and he thinks ether by far safer than it. The chief reason of the preference given to chloroform over ether is, that it is more portable, more powerful, more rapid, complete, and persistent in its action than the other, as well as more easily respired. (Account of New Anæsthetic Agent; Simpson, Edinb., 1847.) In my mind, however, these properties form a very questionable superiority; for the more rapid its action, the more dangerous its power; and it is acknowledged as a principle, that no agent, be it what it may, which produces a sudden and violent effect, can be employed without considerable hazard. Snow, (Med. Gaz. vol. vii. 1848, p. 618), and Sibson, with other careful observers, consider chloroform to be more dangerous than ether, in consequence of the cumulative property which the former possesses.

‖ I have made no distinction between chloroform and sulphuric ether in respect to their effects upon the animal economy, for their action seems to be precisely similar. "The action of chloroform and ether is essentially the same." (Snow,

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Med. Gaz. vol. vi. 1848, p. 74.) "Judging from analogy, the effects of ether and chloroform in producing insensibility appear to me to be precisely similar." (Robinson, Idem, p. 212.)

* Dr. G[illegible]er, after injecting chloroform into the veins, found "the heart gorged with clotted blood, and its irritability destroyed. The lungs were congested to a surprising degree." These experiments were performed so long back as 1842. (See Edinb. Med. and Surg. Jour. vol. lviii. p. 355, Oct. 1842.) Mr. Thomas Wakley (Lancet, vol. i. 1848, p. 25,) says, "The examinations [of the animals that were destroyed by chloroform in his experiments] prove that blood almost black had collected in the heart and lungs, and the great vessels connected with those organs, to a degree of intensity which was probably never surpassed. Anything of the kind more striking, was probably never witnessed in *post mortem* examinations." M. Amussat found, in animals killed by ether, the arterial blood almost black and liquid; the right cavities of the heart containing a large quantity of fluid black blood; the lungs throughout of a deep red colour; the liver and kidneys gorged with blood; the vessels of the dura mater loaded, and those of the pia mater greatly injected. (Med. Gaz. vol. iv. 1847, p. 879.) In Mad. Labrum's case, (Gaz. Med. Oct. 20, 1849,) the membranes of the brain, and especially the veins at the base, together with the sinuses of the dura mater, were gorged with black fluid blood. The substance of the brain was healthy, but when cut presented numerous dark bloody points; a large quantity of serum filled the base of the cranium and vertebral canal; the lungs were crepitant throughout, and of a greyish slate colour. In the case of Hannah Greener and others, the lungs were highly congested. (See Med. Gaz. vol. vii. 1848, p. 108.)

† In the case of Mr. Badger, "the lungs presented little sign of congestion." (Med. Gaz. vol. vii. 1848, p. 79, Note.)

‡ "The lungs seemed quite healthy." (Glover, loc. supra cit.)

§ In the case of Hannah Greener, "the brain externally and internally was more congested than usual, and the ventricles contained rather more than the usual quantity of serum." (Sir John Fife's account of the dissection, Med. Gaz. vol. vi. 1848, p. 253.) In the case of Mr. Badger, "the membranes presented a congested appearance all over the cerebral mass; there was nothing abnormal in the cerebrum, nor any effusion into either ventricle." (Dr. Waters' account of dissection, Med. Gaz. vol. vii. 1848, p. 79.) In some of Dr. Glover's experiments there was congestion of the membranes of the brain, as well as bloody spots on the substance of the brain itself, with much serum in the ventricles, and at the base. (See Exp. 63, same vol. p. 41.)

‖ In M. Gorré's case at Boulogne, (Mdlle. Stock) bubbles of air were found in the veins on the surface of the brain, in the ophthalmic veins, at the base of the brain, as well as in other parts of the body. (Med. Gaz. vol. vii. 1848, p. 212.) Bubbles of air were also discovered in the sinuses of the dura mater, which vessels contained more blood than natural, in the case of death from chloroform at Cincinnati, (Med. Gaz. vol. vii. 1848, p. 81.) But as in both these cases artificial respiration had been practised, the air might have been forced into the vessels by the strenuous efforts made by the medical men to arrest the fatal termination. This hypothesis, nevertheless, will admit of a doubt; for Langenbeck, after amputating a leg, whilst tying the arteries, "*observed black blood and gas bubbles* issuing from the wound." The man died of the effects of chloroform, as it is reported, in half an hour after the operation. "The same occurrence took place lately at La Charité during the operation for excision of showed any deviation from the healthy standard.* Sometimes the blood has been rendered almost black;† at others it has retained its natural hue; generally its coagulability has been considerably impaired.‡

This class of remedies seems to possess the power, in common with some narcotics, of producing congestion of the capillary vessels throughout the whole body;§ and we may safely assert, that in the great majority of instances the lungs have been more or less turgid; that the right side of the heart has been filled with dark, fluid blood; and that the heart itself has been softer than is usual, having partaken, no doubt, of the baneful impression made upon the muscular structures in general. We may therefore fairly infer, that when death has followed the inhalation, the fatal event has happened either from congestion of the lungs, and suffocation of the right side of the heart, or in consequence of direct paralysis communicated to it, in common with the muscles of the extremities.

That the local application of chloroform to the extremities will occasion numbness, insensibility, and paralysis, is a fact confirmed by many;‖ and that it will put a stop to its pulsations, when applied directly to the denuded heart of the rabbit and the frog, the experiments conducted by Snow distinctly prove.¶ When the blood, then, is charged with a proportion of vapour beyond what the life-force of the organ can resist, the same effects are developed, by the poison acting from within, as would show themselves were it applied to the external surface; and to a degree indeed

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the lower jaw. On examination much black and frothy blood was found in the right heart." (Med. Gaz. vol. x. 1850, p. 23.) In a case of death also at Berlin, where no attempt at restoration by inflation appears to have been made, the membranes of the brain were slightly congested; the larger veins contained some air." (Med. Gaz. vol. x. 1850, p. 484.)

[*] In the case of a dog killed by chloroform, detailed to the Parisian Academy of Sciences, by Dr. Plouvier, of Lisle, on dissection there was nothing to indicate the cause of death. (Med. Gaz. vol. vi. 1848, p. 214.)

[†] Glover's experiments on animals. (Med. Gaz. vol. vi. 1848, p. 40.) In M. Gorré's fatal case at Boulogne, the blood was "literally as black as ink." (Ib. p. 213.)

[‡] Lassaigne, as reported in Med. Gaz. vol. iv. 1847, p. 526; Pickford (Brighton Gaz. June 3rd, 1847). M. Gruby, in a communication to the Academy of Sciences, says, that arterial blood remains red, when chloroform is inhaled, but becomes black under the action of ether. (See Med. Gaz. vol. v. 1847, p. 1123.)

[§] One of the "distinguishing characteristics of these substances (chloroform, &c.) is the remarkable power they possess of obstructing the pulmonic circulation." (Glover, Med. Gaz. vol. vii. 1848, p. 42.) "Turgidity of the capillaries is an effect of the narcotic poisons." "The experiments of Mr. Wakley show that ether and chloroform cause distension of the capillaries of the lungs and other internal organs." (Sibson, Med. Gaz. vol. vi. 1848, p. 267.)

[‖] See Simpson's Experiments on Animals as well as the Human Subject (Med. Gaz. vol. vii. 1848, pp. 63 *et seq.*), and Nunneley, Remarks, (same vol. p. 1094.)

[¶] Med. Gaz. vol. vii. 1848, pp. 414 and 614, &c. "Chloroform may stop the action of the heart, if directly applied to it." (Murphy, Chloroform in Childbirth, 1855, p. 20.)

intensely greater; because the coronary arteries being filled with the poisoned fluid, would carry its deadly freight throughout the whole muscular tissue of the heart, and thus cause it to circulate in direct proximity to the fine nervous *fibrillæ*, supplying the great centre of the life-sustaining current:* and these phenomena would appear equally in the human subject as in the rabbit and the frog. Or, the vapour being brought into immediate contact with the minute filamentous extremities of the pneumo-gastric nerves ramifying on the air-cells, may, if in too concentrated a state, directly communicate a fatal paralysis to the heart, through the medium of the cardiac branches.

The apparent anomaly, that in some instances so large a quantity has been used without producing any other effect than that of temporary insensibility, while in others a very small dose has occasioned coma and death, can be explained not only upon the peculiarity of constitution which renders different individuals susceptible to the powers of the medicine in various degrees; but also upon the principle of the extent of the concentration in which the vapour has been allowed to pass into the air-cells of the lungs. It has been estimated by Snow, that the human system will not bear more than four or five per cent. of the vapour of chloroform † when mixed with atmospheric air; any greater proportion bringing danger and death. Mr. Cock, in his evidence respecting a fatal case that occurred at Guy's Hospital, while he was operating, the patient being a very powerful man in the police force, stated that a very small quantity had been used,—*not a tenth part* of what had been administered in other cases.‡

We are told, that if anæsthetic vapours be objected to because of their poisonous nature, and the danger which that quality brings with it, we ought therefore to banish opium, arsenic, and hydrocyanic acid, with all other poisonous drugs, from our materia medica, and cease to use them as therapeutic agents.§ But my objection to employing chloroform in natural labour does not rest merely upon the fact of its capability to destroy life; but upon the rapidity with which it may kill;—the instantaneous violence with which the death-blow is dealt; and the total want of command which those even experienced in its administration possess over it, to avert its dreadful influence, when that is carried beyond a certain limit.‖ In giving poisonous drugs by the mouth, we can calculate to the minutest nicety the quantity which we use, and consequently the quantity that will be absorbed; we may watch their effects upon the frame hour by hour, and we can suspend our means when the condition we desire to produce is arrived at. Not so with these vapours. Although we may measure exactly the dose that we employ, we have no means of testing the actual proportion taken up; and we possess but little control over the degree of concentration in which they are introduced. Received into the system in the most subtle and attenuated form, through the immense expanse of the bronchial cells, they are taken at once into the blood, and diffused with marvellous celerity throughout the whole body; and thus their force is applied in the most effective manner that could possibly be devised to the production of their peculiar power,—a power that, as I have already declared, I should be most unwilling to see exerted, if for no other purpose than to abrogate the purely physiological pains of parturition.

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* "The blood passing into the coronary artery is less diluted, is more strongly impregnated with chloroform than is the blood in any other part of the system, except the lungs." (Sibson, Med. Gaz. vol. vii. 1848, p. 109.)

† Med. Times, Aug. 31, 1850, p. 229.

‡ Med. Gaz. vol. xi. 1850, p. 39.

§ Murphy, Further Remarks on Chloroform in Mid. p. 37, also Chlor. in Childbirth, 1855, p. 56. Hird, Med. Gaz. vol. viii. 1848, p. 209. Simpson, Inhalation of Sulphuric Ether, p. 9, Note.

‖ "Art is powerless when dealing with the poisonous effects of this vapour. We

II. Some difference of opinion exists, as to whether chloroform interferes with uterine action, or not. Denham,[*] Montgomery,[†] Steele of Montrose,[‡] Banner,[§] Siebold,[||] Nevins,[¶] and others, have stated that it sometimes suspends the contractions. While Murphy,[**] Channing,[††] and Simpson [‡‡] think this very rarely the case; and even affirm that they are occasionally increased under its use. For my own part, I may say, that in most of the comparatively few cases in which I have given it, although the constitution has been but slightly impressed, some diminution of uterine power was apparent. But the patient must be *completely* narcotized before the contractions are entirely removed; and this is owing partly to the sources whence the uterus derives its nervous supply, and partly to the progressive order, in which the vapour affects the different divisions of the nervous system. We have seen that first the *cerebro-spinal* becomes paralysed, then the *reflex* or *excito-motor*, and, lastly, the *ganglionic*. Now, it is evident, since the uterus obtains a portion of its supply from each of these three sources, that, provided any one of them has escaped the influence of the vapour, it will continue to act, although probably with a less amount of vigour. If the nervous system has

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have heard of some very narrow escapes, even where precaution and skill of the best kind had been employed in its administration." (Editor, Med. Gaz. vol. vii. 1848, pp. 68, 69.) "Death from chloroform seems to commence at the heart; to accomplish this, the dose must be concentrated." (Murphy, Chloroform in Childbirth, 1855, p. 23.)

[*] Dublin Journ. vol. viii. pp. 116, 118.

[†] Objections to the Indiscriminate Administration of Anæsthetic Agents in Midwifery.

[‡] Simpson's Anæsthetic Mid. p. 31.

[§] Med. Gaz. vol. viii. 1849, p. 566.

[||] Med. Gaz. vol. iv. 1847, p. 1053.

[¶] Med. Gaz. vol. vi. 1848, p. 383.

[**] Chloroform in Childbirth, 1855, p. 37.

[††] Ætherization in Childbirth, p. 233.

[‡‡] Notes on the Inhalation of Sulphuric Æther in Mid. p. 6.

been but slightly affected, the reflex and ganglionic centres being still free, its action will most likely not be much interfered with; but if the inhalation be carried so far, that the reflex portion becomes implicated, evidenced by stertor, loss of motive power, and insensibility, there will be observed a decided diminution of uterine energy; and should a state of deeper lethargy be induced, not only will the uterus be paralysed; but the other organs also, which are embraced within the ganglionic circle, will partake of the general morbid relaxation; and the patient's life will be placed in the utmost jeopardy.

III. Some practitioners contend, that whatever diminution of propelling power the uterus may suffer, under the influence of anæsthetic vapours, is more than compensated for, by the laxity they occasion in the soft passages, which the child must traverse. It is, indeed, generally acknowledged that they tend to cause a relaxation of those structures, and so far to render the birth in some degree more easy. Dubois, in one of his cases, observed an extreme laxity of the muscular layers of the perineum.[*] Siebold makes the same remark in reference to two forceps cases, in which he employed narcotism.[†] Nevins,[‡] Moir,[§] Channing,[||] Murphy,[¶] Dyce, of Aberdeen,[**] and Simpson,[††] all assert that the inhalation of chloroform renders the soft parts infinitely more yielding than they would have been without its use, and that it, consequently, much facilitates dilatation; while Murphy assigns to it the same power over the os uteri.

That the muscular structures at the outlet of the pelvis should lose their tone, and consequently be deprived of their resistant power, under the influence of chloroform or any other anæsthetic, as do the general muscles of the body, is only what might have been expected; but that it should increase the dilatability of the other soft parts, and especially that it should promote a more copious secretion of the lubricating mucus, is a circumstance not very easy to be comprehended.

Nevertheless, in the case of women bearing their first child late in life, or in any other, where more than ordinary rigidity exists, the removal of the impediments which the muscles oppose, will, in itself, be attended with no small benefit.

IV. By some,[‡‡] again, the use of anæsthetics is advocated on the plea that they counteract *the shock of labour*, and thus conduce to a more speedy and favourable recovery than otherwise would take place. This argument is based upon a fallacy. In a case of common labour, if it be carefully conducted, the constitution of the woman suffers no shock at all, properly so called. It appears to me, indeed, that a much greater shock is likely to be induced by the anæsthetic agents themselves: and it is our bounden duty to take care that the means used are not calculated to produce greater distress and injury, than the sufferings they are intended to annul. For it is a maxim that cannot sink too deeply into the mind of the young practitioner, that "to employ dangerous remedies for non-dangerous cases is at variance with the established principles of our art.* "

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[*] Lancet, vol. i. 1847, p. 247.

[†] Med. Gaz. vol. iv. 1847, p. 1053.

[‡] Med. Gaz. vol. vi. 1848, p. 383.

[§] Simpson's Anæsthetic Midwifery, p. 33.

[||] Ætherization in Childbirth, p. 233.

[¶] Chloroform in Childbirth, 1855, pp. 34, 50, 51, and 70.

[**] Simpson's Anæsthetic Mid., p. 29.

[††] Idem.

[‡‡] Simpson, Murphy, P. Smith on the Employment of Ether in Obstetric Practice, pp. 7 and 23.

V. Much misapprehension has arisen in the mind of the public, and especially the female portion of it, regarding the character of anæsthetic inhalation, and the direct effects which the vapour occasions, by the fervency with which its virtues have been proclaimed, and by the erroneous qualities attributed to it.

Those who have come forward as the chief advocates for anæsthetics under labour, have either entirely denied,† or maintained an undisturbed silence in respect to *their intoxicating properties*. The public has been led to believe that their action was merely soporific and anæsthetic;—they have been told that "in most cases the mothers after delivery, on waking from their anæsthetic sleep, have expressed surprise at their own feelings of strength and perfect well-being;" ‡—that the patient "stated her sensations to be those of awaking from a very comfortable sleep;"—that "on awaking she declared she had been sleeping refreshingly;"—that "she awoke altogether unaware that her child was born;" §—and by another distinguished writer, that "she lay asleep while her child was being born, and did not awake for five minutes after her delivery:" ‖ thus the true condition into which the patients have been thrown, as well as the dangers they have incurred, have been carefully kept from view.

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* In following up the history of the application of etherization to obstetric medicine, nothing has surprised me more than the length of time which some practitioners have ventured to keep their patients under the uninterrupted influence of the vapour. Simpson tells us he "has kept up the anæsthetic state during periods varying from a few minutes to six hours." (Superinduction of Anæsthesia, p. 18.) And he relates a case in which a woman was kept under its influence for thirteen hours. (p. 22.) Dr. P. Smith says he has kept patients under its influence from half-an-hour to twenty-eight and a half hours. (Simpson's Anæsthetic Mid., p. 33.) Mr. Lansdowne of Bristol can see no possible reason why a limit should be set to the length of time in which it may be used (eod. loc., p. 35); and, at page 34, the same gentleman says, "it may (as has been the case with me) be used by any friend, or the nurse, should the practitioner require to be absent for a short time." Surely such language is calculated to lead to the reckless employment of a poison both most dangerous and uncertain in its action.

† Murphy, Further Observations on Chloroform in Midwifery, p. 34; Clendon on the Use of Chloroform in Dental Surgery, p. 11.

‡ Simpson's Anæsthetic Midwifery, p. 13.

§ Simpson's Remarks on the Superinduction of Anæsthesia in Labour, pp. 16, 17, &c. &c.

‖ Murphy, Further Observations on Chloroform in Midwifery, p. 17.

No doubt it is a great bait to offer, and a great boon to promise a woman who is looking forward with anxiety to her approaching confinement,—that she is to be lulled into a sweet, quiet, placid sleep;—to be perfectly unconscious of all the distress and suffering attendant on her labour;—and to be recalled to the world only by the grateful cries of her infant. But if the case were put fairly and honestly before her;—if she were informed that to insure immunity from pain she must pass through the stages of inebriation; that, in fact, she was not to be steeped in sleep, but drowned in intoxication, I much question, whether this knowledge would not banish anæsthetic vapours from the lying-in room, and preclude the desire to take advantage of their aid, in every case except where the amount of suffering greatly exceeds what is commonly endured.

The latest writer* on chloroform contends that it does not possess any intoxicating qualities; and tries to clear away this objection which I have made to its use, by a bold and sweeping denial. "The anæsthesia of chloroform," says he, "has not the least resemblance to drunkenness; they have not a symptom in common. Alcohol mixes intimately with the blood; chloroform does not. The one is highly stimulating; the other not at all so. Alcohol has no anæsthetic power, unless taken in very large quantities, when the imbiber, after a stage of most boisterous excitement, arrives at the condition termed 'dead drunk,' the anæsthesia of alcohol. Chloroform manifests this power without the least excitement: it produces anæsthesia, and takes away pain without disturbing the intellects in the least degree."

These are mere assertions; and we will see how they are borne out by facts, and by the observations of other writers. We have learned that Snow † says, in the first degree, "there exists a kind of inebriation, which is usually agreeable when induced for curiosity;" that the second "corresponds with that condition of an inebriated person who is not *dead drunk*, but in the state described by the law as *drunk and incapable*." Sibson ‡ tells us "exhilaration is followed by excitement, excitement by cerebral disturbance; at this time the person affected revels in the absurdities of social intoxication." M. Valleix, physician to the Hôtel Dieu, speaking of the second stage, says, "It is a true delirium, absolutely like that of drunkenness."

Meigs remarks, "I cannot avoid the feeling of astonishment which seizes upon me, when I read the details of cases of midwifery, that have been treated during the long *profound drunken-*

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* Murphy, Chloroform in Childbirth, 1855, p. 64.

† Med. Gaz. vol. vi. 1848, p. 267.

‡ Ibid. vol. vii. 1848, p. 305.

ness of etherization;"[*] and again, "Chloroform is not a soporific; and I see in the anæsthesia it superinduces, a state of the nervous system, in no wise differing from the anæsthetic results of alcoholic potations, save in the suddenness and transitiveness of its influence.[†]"

Simpson, himself, acknowledges the identity between drunken stupor, and the insensibility from anæsthetic vapours, in the following passage—"Deveux mentions a fact still more in point, because in it the analogy with the operation of ether is still stronger, or *indeed is identical*. 'A woman,' says he, 'was brought to the Hôtel Dieu, at Amiens, in a comatose state, in consequence of her taking spirituous liquors since the commencement of labour. She was delivered naturally in this state, and slept for some time after delivery. The woman on awaking, much surprised at finding her delivery completed, *congratulated herself on having made so happy a discovery, and declared she would make use of it if she had again occasion.*[‡]"

Murphy, although he denies that chloroform has any stimulating properties, affords in his writings abundant evidence of its intoxicating powers. He says that "chloroform, alcohol, and the other ternary compounds of hydrogen and carbon, influence the system in the same manner, but differ essentially in degree and the rapidity with which their effects are produced."[§] "Some cannot take it without being excited; they ramble, and soon become incoherent.[||]" "The first stage is stimulation, or excitement. Alcohol affords the best example of the first stage. Chloroform causes some excitement; but, if pure, very little."[¶] All writers on the subject speak of the stage of excitement; and this can only be produced by stimulating means.

A fact adduced by Murphy proves the identity of the effect of ether-inhalation with that of the drinking of ardent spirits. "Cases have occurred," he remarks, "in which an inordinate draught of brandy has been followed by instant loss of nervous power, and the drunkard has fallen down perfectly insensible, in a state of anæsthesia."[**]

In the work just quoted, the same author declares that "some patients are delighted with their sensations;"[††] and that "the same dose of chloroform given in precisely the same manner, produces different effects on different constitutions."[‡‡] This is exactly what we observe in incipient inebriation: some experience delightful sensations; while some are sullen, morose, and stupid.

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[*] Treatise on Obstetrics, 1852, p. 368. [†] Idem, p. 373.

[‡] Inhalation of Ether, p. 7. It is acknowledged, as M. Valleix affirms, that ether and chloroform produce exactly the same phenomena.

[§] Chloroform in Mid., 1855, p. 8. [||] Idem, p. 36. [¶] Lectures on Midwifery, p. 455.

[**] Chloroform in Mid., 1855, p. 9. [††] Idem, p. 27. [‡‡] Idem, p. 36.

A friend and former patient of my own was not long since confined, at some distance from London, of her seventh child, under chloroform, given by a gentleman who is practically well acquainted with its administration. Her husband, in announcing her delivery to me, told me, that while under its influence, in her labour, she sang an Italian air. What was the state of this lady's nervous system at this time? Was it not very much in the condition characterized by Dr. Sibson, which I have noticed above? This is by no means a solitary case; for this same lady's attendant says, that he could report many similar instances.

The identity of chloroform with alcohol is further proved by the effects of chloroform when taken into the stomach, and of the concentrated fumes of alcohol when respired. Dr. Alfred Taylor communicates the case of a young man who swallowed *four ounces of chloroform* at one draught, and whose life very nearly fell a sacrifice. The symptoms developed teach us that when this drug is *taken as a liquid*, the consequence is not a state of anæsthesia, but that phenomena ensue, exactly resembling those of alcoholic poisoning.* And I am informed by a spirit-rectifyer in London, in a large way of business, that his men, when they clean the huge vats out once a year, are made perfectly drunk in a short time by the fumes, stagger about, and do not recover until they have slept. There is no doubt that if exposed too long, insensibility would supervene, and anæsthesia would follow. So that the inhalation of an atmosphere highly charged with the vapour of alcohol produces the same effect as the inhalation of chloroform.

Thus, notwithstanding Dr. Murphy's emphatic declaration that the anæsthesia of chloroform *has not the least resemblance to drunkenness*, I think I have shown that the effects of the one are *perfectly similar* to those of the other—indeed, that they are *identical*. I will now prove their similarity by the composition of each, and its *modus operandi*. Chloroform is a hydro-carbon, and so is alcohol; the former consists of two parts of carbon, one of hydrogen, and three of chlorine—the latter of four parts of carbon, six of hydrogen, and two of oxygen; and it has been already shown that carbon is the really essential constituent, the other ingredients only modifying its action. Both owe their active properties to the same element; and, as might be expected, both influence the system in the same manner. We have seen that chloroform has so great an affinity for oxygen that when circulating with the blood, it prevents the carbon generated in the body becoming converted into carbonic acid, and that therefore there is less of that gas exhaled through the lungs than there ought to be. Dr. Prout has demonstrated that in drunkards, also, the due proportion of carbonic acid is not set at liberty in the lungs, precisely from the same cause.*

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* Med. Gaz. vol. xii. 1851, p. 675.

We have here everything required to identify ether-inhalation with inebriation: the composition of the fluid, the effects upon the system, and the immediate mode by which those effects are produced, are exactly alike. With these facts so palpably displayed, it appears to me impossible for any impartial person longer to affirm that chloroform does not possess intoxicating properties—that its action does not resemble that of alcohol. It follows, therefore, that the total loss of power and feeling induced by etherization is not sleep, but drunkenness. The only kind of sleep, if sleep it can be called, in the least degree analogous to it, is that death-like insensibility into which a person is cast when stupified by spirituous liquors—a state but little removed from apoplexy, and which, indeed, in many instances, has eventuated in a seizure of that dreadful malady. Even from stupor caused by opium, a patient can be roused by loud and sudden noise, as the firing of a pistol, or by violent usage; but no power on earth could recal to his senses and sensibilities one overwhelmed by the deadening influence of the vapour of chloroform, so long as it retains within its grasp the unconscious victim of its irresistible might.

In this difference resides one of the chief distinctions between sleep and the stupefaction occasioned by anæsthetics. From sleep, the slumberer may be awoke at pleasure; the stupefaction of ether-inhalation cannot be shaken off at all, but will continue until the system, having gradually released itself from the oppressing incubus, is again rendered free for the reception of external impressions by the liberation of the vapour from the blood, and its entire extravasation from the body.

It is no answer to these objections to adduce that the influence of a stimulating vapour, when taken into the system by the lungs, is as soon dissipated as it was speedily established; while it is both longer in acting and more persistent when imbibed by the stomach. Evidence enough has been brought forward to prove that the effects are exactly the same, so long as they last, in whichever way it may be received into the blood;—that the same stages are gone through except in those cases where instantaneous death results, and that the organs of thought and feeling are reduced in both cases to the same senseless condition.

Every day it is happening that women are delivered without painful sensation,—under a condition that produces a natural anæsthesia,—as well as without any consciousness of the progress and termination of their labour: I mean when struck down by apoplexy, or that more frequent form in which this dreadful disease shows itself, when it makes its onslaught during labour—puerperal convulsions.* And the profession, without exception, regard the state of insensibility into which a patient under such circumstances is thrown, with pity, horror, and alarm. Is there so much difference between the insensibility produced by the one cause and that occasioned by the other, that we should look upon the one with such anxiety and apprehension, while we are not only to accustom ourselves to speak of the other as perfectly free from all kinds of danger,† but are urged to induce it voluntarily, and to glory in the power we possess of annihilating for a time the proudest and choicest characteristics of humanity?

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* Murphy, Chloroform in Childbirth, 1855, p. 11. See also Lect. in Mid., p. 447.

From what I have said, the reader will gather that I look upon the administration of chloroform as uncalled-for and inadmissible in common cases of ordinary labour; that I believe a partial effect may *very generally* be induced by the inhalation of a small dose; but that the drug is of so treacherous a nature, we are as yet so little acquainted practically with its properties, and have so little control over its powers, that we cannot positively affirm in any case that we can employ it without danger. And as I consider that we are not justified in augmenting in the smallest degree the perils that hover around a parturient woman, without grave occasion, so I would raise my voice loudly against its use, unless some extraordinary occurrence should arise, to obviate the consequences of which we might determine that some additional risk may fairly be encountered. For we must bear in mind, what I before advanced, that these pains are not pathological in character; that they spring from a natural, and not a morbid cause; that their effects pass away almost simultaneously with the suffering itself; and that they leave behind them but faint traces of their ever having existed.

Should the suffering endured, indeed, be more than equivalent to the advantage gained by each return of uterine contraction, as in cases of rigidity of the os uteri or of the other soft structures, the cautious exhibition of anæsthetics may be permitted. So, also, when deficiency of room in the bony pelvis renders craniotomy necessary. In such cases, however, as well as in delivery by the forceps, we shall require to bring the patient fully under the influence of the vapour before the instruments are had recourse to;‡ for if she be but partially narcotized, it is more than probable that at the very outset of the operation she will become boisterous, turbulent, and unmanageable, to the great embarrassment of the practitioner, as I have myself experienced. Now, as I believe that the impression made on a parturient woman by anæsthetic vapours would be more violent, and especially more lasting, than on any other kind of patient, although it might not be immediately more evident, I should fear that they would possess an influence over her more dangerous than they would exert upon less vivid sensibilities. I would therefore much prefer delivering artificially, without the intervention of anæsthetics; especially as I have found that women almost invariably bear these operations with great fortitude, with sufficient corporeal quietness, and admirable mental resignation.

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* See the Subject "Puerperal Convulsions" in this work.

† See the letters of different practitioners in Simpson's "Anæsthetic Midwifery."

‡ "When induced for operative purposes in midwifery, the anæsthetic state should be as complete and profound as when it is induced for operative purposes in surgery." (Simpson's Anæsthetic Midwifery, p. 17.)

In cases of transverse presentation, where the membranes have been some time ruptured, and the forcible action of the uterus would prevent the introduction of the hand for the purpose of turning the fœtus without the employment of great exertion, chloroform may be administered, with the two-fold intention of saving the patient much suffering, and also of overcoming the resistance opposed, and in this manner diminishing the chance of injury to the organ.*

We are not, however, to expect that in every case of contracted uterus under a transverse presentation, we shall be able to accomplish the object of turning, even although we completely narcotize our patient; for a state of permanent contraction is the result of and follows a long continuance of tonic action, which will not yield to any means that art can employ, as I have noticed in the section on transverse presentations in the present work. This will account for those cases in which, although the woman "was brought under the full influence of the vapour," and "profound sopor" was induced, still extreme difficulty was experienced in passing the hand, in consequence of "the strong contraction of the fibres of the uterus about the child." † It is the *permanent* diminution in capacity of the uterine cavity that occasions the difficulty in this kind of case.

Again; it is possible that the uterus may have contracted so strongly round a retained placenta, as to refuse admission to the hand for its removal, except on the employment of a degree of effort on the part of the operator that would be dangerous to the patient. Under such circumstances, the relaxing power of chloroform might be tried to facilitate its introduction. But I have myself never met with an instance in which I could not remove the placenta, if the attempt was made within five or six hours of the child's birth, provided the full term of gestation were arrived at.

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* That chloroform possesses the power of suspending or lessening the strength of uterine contraction, I am quite satisfied, from the experience I have had in its use; and Dr. Snow informs us that he administered it in two cases of transverse presentation, in both of which "the operation of turning was performed with singular facility, although the liquor amnii had been evacuated some time." He also mentions another case, where he was present, in which version was had recourse to under a natural presentation, "on account of the narrowness of the pelvis, and the impossibility of applying the forceps; the introduction of the hand was difficult from want of space; but the uterus offered no resistance." (Association Med. Journ., June 10th, 1855, p. 502.)

† Murphy, Chloroform in Childbirth, 1855, p. 18.

Dr. Simpson avers* that "the London physicians have, on several occasions, specially distinguished themselves by their determined and prejudiced opposition to all innovations in practice not originating among themselves." I cannot subscribe to the justice, and will say nothing of the liberality of this charge;—at least in reference to recent times; and, for myself, I can truly affirm, that the sentiments I hold in regard to the employment of anæsthetic vapours in labour have no foundation in *prejudice;* that is, they are not conclusions arrived at without thought and examination; for I have given the subject constant, deep, and anxious consideration; and have canvassed its merits with the ardent desire to become a convert to the use of these means, if I could conscientiously do so. I have had the advantage also of a long correspondence with the talented, zealous, and indefatigable proposer of the measure, who has paid me the compliment of taking much trouble to bring me over to his way of thinking. Nevertheless, I have not seen the least reason to alter the opinions I at first entertained,—that before anæsthetics can be introduced *for the relief of the ordinary pains of child-birth,* it must be proved incontestably that they are *invariably* safe both to the mother and her infant.

IRREGULARITIES OF HEAD PRESENTATION.

Notwithstanding that, according to the arrangement which I have chosen, all varieties of head presentation are considered natural; still, as some are of infrequent occurrence, they may be regarded as *irregularities;* and under that term I shall proceed to describe them.

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* Anæsthetic Mid. p. 37, note. The learned professor seems to have inoculated some of his contemporaries of the modern Athens with his feelings on this subject. For Mr. Carmichael Scott, writing to the editor of the Medical Gazette, says: "The Edinburgh practitioners only laugh at our London prejudices and objections to it [chloroform in labour], knowing as they do, from abundant experience, that there is *no foundation whatever* for any of them." He then indulges in a little sly sarcasm, at the expense of the profession in London, by remarking: "But, at the same time, no one wonders that such objections and prejudices are current in London." (Vol. x. 1850, p. 81.)

VERTEX PRESENTATION, WITH THE FACE BEHIND EITHER GROIN.—When the fœtal cranium enters the pelvis with the face situated behind either of the groins, (plate 36,) it must be evident, as I have before remarked, that the head is by no means so well adapted to the cavity, as when the face is directed to the ilium, (plate 34,) or looks diagonally backwards to one of the sacro-iliac symphyses (plate 35); and this want of accommodation sometimes induces a lingering labour, and may oblige us to have recourse to instrumental aid.

But although a tedious case may be anticipated under this malposition; although the sufferings may be greater, and the time of duration more protracted than is usual;—the mere irregularity of situation is not of itself sufficient to warrant us in terminating the case by artificial means. We are not to interfere instrumentally because the face is placed anteriorly; but we must wait till some circumstances appear which call imperatively for relief and assistance. It matters not whether the face is looking backwards or forwards,—to one side or the other,—it is our duty to trust to the power of nature within a certain limit; should such symptoms, however, arise as indicate danger, we must not allow them to become aggravated; but have recourse to such means compatible with the case, as are least likely to be attended with injurious consequences.

The mechanism of the head's passage under this presentation will be found at page 110. When the face turns forwards on the expulsion of the head, the body passes with the back of the shoulders sweeping the hollow of the sacrum (plate 43). They then turn a little sideways; and the centre of the abdomen appears under one of the rami of the pubes, instead of being directed backwards as in the more ordinary cases.*

Mode of detection.—It is not very probable that this position will be distinguished before the membranes break; because, as the vertex presents, the posterior fontanelle will first offer itself to the finger, and it will be difficult to detect the course which the different sutures take thus early in the labour. Besides which, I have already advised when we have positively satisfied ourselves the head is the presenting part, that we should not endeavour to gain further information respecting its precise position while the membranous cyst remains entire; partly because of the difficulty of doing so, but principally because of the danger of inadvertently evacuating the liquor amnii prematurely. After the second stage, however, has commenced, when the expulsive pains are well established, we shall probably find that the head does not descend with its usual ease and regularity; and on making as accurate an examination as we can, to ascertain the cause of the delay, we shall detect the posterior fontanelle at the back part of the pelvis, against one or other of the sacro-iliac junctions, and we shall be able to trace the sagittal suture running upwards and forwards, to terminate in the large diamond-shaped, open space—the anterior fontanelle—situated behind the opposite groin, as would be the case in plate 36.

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* See note, p. 115.

Being assured that the head occupies this situation, I would strongly enforce the recommendation not to interfere early in the labour, but to wait in the hope and expectation either that it will be expelled in the manner described at page 110; or, which indeed is much more likely, that the face will be gradually turned backwards into the hollow of the sacrum, and eventually make its exit, gliding over the perineum. Presuming, however, that after a number of tolerably strong expulsive pains, no advance takes place in the situation of the head, it will then be proper to embrace the cranium between the three first fingers and the thumb of one or other hand, and to give the face an inclination to the right or left ilium, according as its original direction was to the right or left groin: and this attempt must be made in the absence of uterine contraction, and before the head has become locked in the pelvic cavity; for if it be delayed till a state of impaction has occurred, the mal-position cannot be remedied by the power of the hand alone, and instruments will most likely be required in order to finish the delivery. In making this change in the position of the head, it would not be right to turn the face at once into the hollow of the sacrum, even if that could be accomplished; because the probability is, that the child's body being held tight within the contracted uterus, would not follow the sweep which the head describes; and we should incur great danger of injuring the neck. All that we are required to do, is to incline the face to one of the ilia, and leave the rest of the process to nature.*

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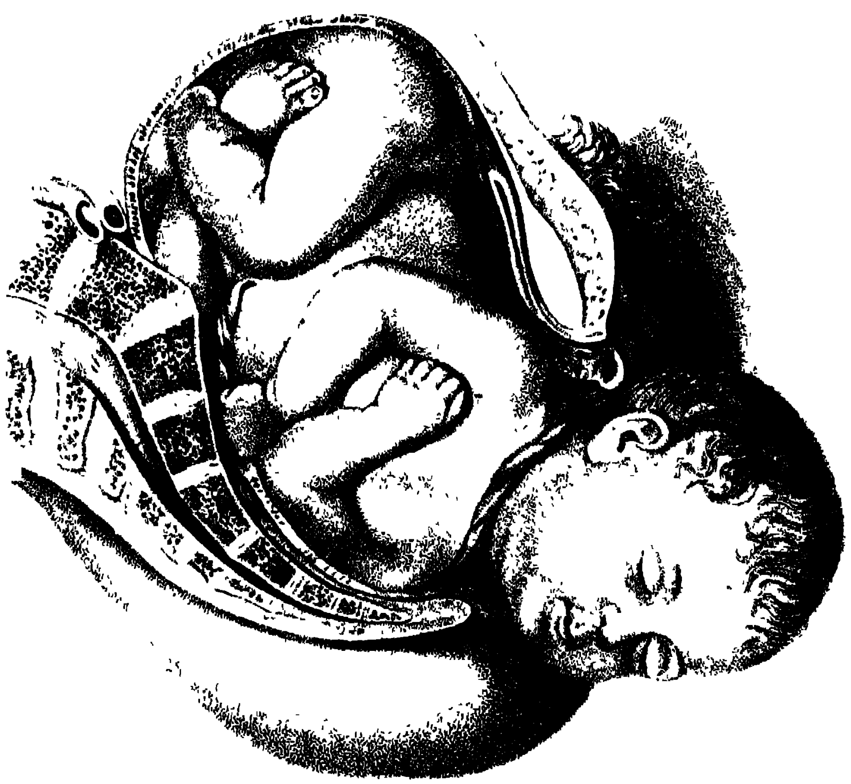
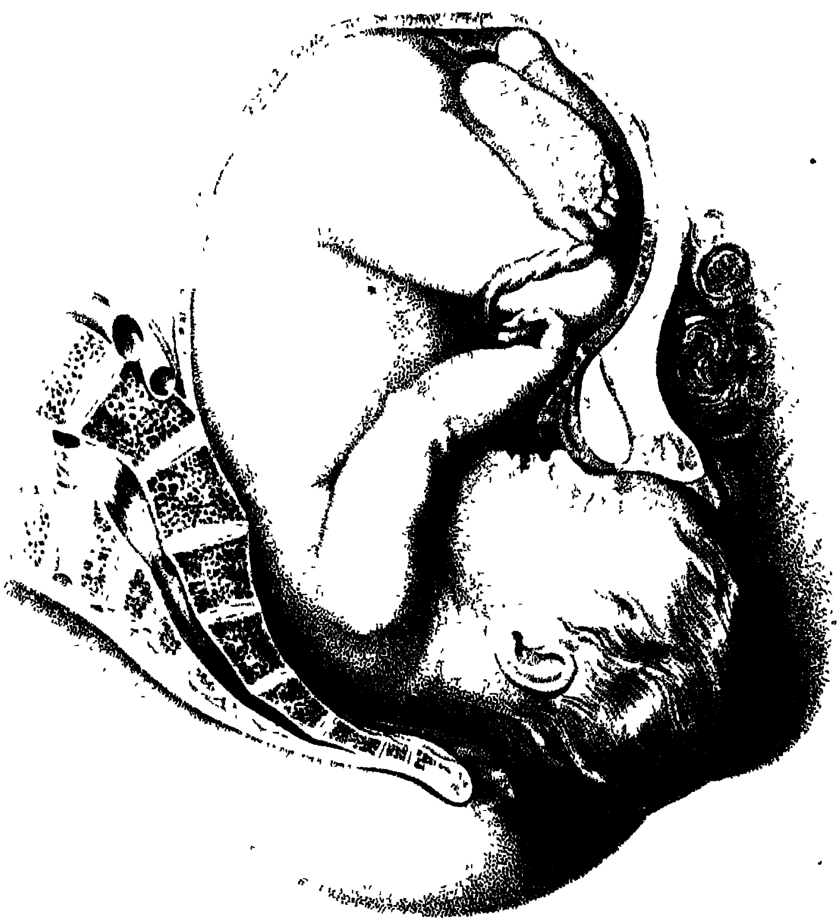
* I have thought it better not materially to alter the text, as written by me in the year 1839, although of late a change has come over the minds of many members of the profession, (in which, to a certain extent, I participate,) regarding the comparative frequency of the different kinds of vertex presentation; and this chiefly in consequence of the publication, by Naegelè, of his views upon the subject. An essay on the mechanism of parturition, composed by that distinguished professor for one of the German periodicals, afterwards republished in a separate form, in 1822, and translated into English by Dr. Rigby in 1829, attracted very considerable attention as well here as on the Continent; and has served in a great measure to shake the previously established notions on this interesting question.

It used to be the prevailing, indeed almost universal, idea, and, consequently, the received doctrine, not only that the first four positions which I have noted,—namely, with the face to either ilium, (see Denman's Introd. to Mid. chap. ix. sect vii.; also Davis, Operative Midwifery, p. 236,) or to one or other of the sacro-iliac symphyses, was by far the most frequent presentation; but that its direction towards either of the acetabula at the commencement of labour was of very rare occurrence.

a
b
c





Face directed to the promontory of the sacrum, or the symphysis pubis.—It is very rarely that the head offers itself, at the commencement of labour, above the brim of the pelvis, with the

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(Dr. Jos. Clarke, Trans. of a Soc. for the Improvement of Med. and Chirurg. Knowledge, vol. ii. Burns, Prin. Mid. ed. 5, p. 384. Merriman's Synopsis, ed. 5, p. 44. Blundell's Obstetricy, by Castle, p. 272, where he even says, it may be justifiable to bring down the feet in such cases. Baudelocque, chap. ii. sect. v. parag. 699, and a host of other authors.) It was supposed that the face turned into the hollow of the sacrum only when it was originally directed either laterally to the ilium, or diagonally to one of the posterior pelvic joints; and that, when it looked towards either of the acetabula, the natural inclination was for *it* to turn under the arch of the pubes before the expulsion of the head, and for *the occiput* to pass over the sacrum, coccyx, and perineum. The forward position of the face, therefore, was looked upon as an irregularity, and one requiring extraordinary exertions for its expulsion, because the brow, being so much broader than the occiput, does not accommodate itself so well as the occiput to the form of the pubic arch. As a consequence, it was argued that the whole head is thrown farther back within the pelvic cavity, presses more strongly upon the posterior structures of the pelvic outlet, causes the coccyx to be thrust more outwards, and more forcibly distends the perineum. It was acknowledged, indeed, that, under some extraordinary circumstances, the face, though originally presenting forwards, passed into the hollow of the sacrum before the head made its exit. But this fortunate change was regarded by English as well as Continental practitioners to occur, as Baudelocque (op. cit. parag. 701) expresses it "unfortunately too seldom for the mother's sake." (See besides the English authorities just quoted, —Siebold, Lehrb. der Entbindungskunst, vol. i. p. 368; Frorirep's Manual, and other German authors.)

Naegelè, in the publication referred to, has declared his conviction that the profession has been labouring under a grievous error, in supposing that the face being directed diagonally forwards at the beginning of the labour, is an unusual or irregular situation; and in affirming that the head is expelled, under such circumstances, with the occiput posteriorly. He says, indeed, (p. 36,) not only that the presentation of the face behind the *left* acetabulum is by far the most frequent position, next to that in which it is directed to the *right* sacro-iliac symphysis; but *he is thoroughly convinced*, when the face looks diagonally forward at the commencement of labour, that, not the occiput, but the face, is generally turned into the hollow of the sacrum; and that "this change in position requires no peculiarly favourable circumstances; but that these species of labours can be completed by the natural powers, under the most usual proportions, in the same time, with the same expense of strength, and without greater difficulty than when the head takes the most common position." He states, also, that out of ninety-six cases in which the face presented towards the left acetabulum, (which he observed with particular care, and described in his notebook,) in three cases only did the head clear the passage, with the face directed anteriorly; and in all these three cases there were some peculiarities in the structure of the head or of the pelvis, to which he seems to attribute the forward inclination of the face (p. 45).

That the presentation of the face to either acetabulum, but more particularly to the left, is a far more common occurrence than was generally believed before Naegelè wrote upon the subject, I am perfectly assured; and that in these original presentations, the face most commonly turns into the hollow of the sacrum before expulsion, I am equally persuaded; but that this turn can be performed in as short a time, with as little expenditure of power, and as little pain to the patient, as if the face had originally presented towards either of the sacro-iliac symphyses, I cannot bring myself to believe. It stands to reason, indeed, that, as the face must travel round from the acetabulum to the sacrum, or, in other words, as the head must make a *three-quarter turn of the half pelvis* before it can escape, both that more time must be expended, more power must be employed, and more pain must be endured, than if the face turned from the sacro-iliac symphysis to the sacrum, or had only to sweep over *one-quarter space of the half pelvis*, instead of three quarters. I think Naegelè has both rather over-rated the frequency of this particular presentation of brow directed either against the promontory of the sacrum, (plate 37, fig. 1,) or the symphysis pubis, the vertex being most dependent (fig. 2); so rarely, indeed, that some practitioners of

the head, as well as the facility with which its turn with the face into the hollow of the sacrum is effected.

Naegelè's position is, that the head is almost invariably placed with its long diameter in the direction of the *right* oblique diameter of the pelvis; that is, from the *right sacro-iliac symphysis* to the *left acetabulum.* And Naegelè the Younger, from observations made on 3491 cases of vertex presentation, says that in twelve only of these did the head lie in the *left* oblique diameter, or in the direction from *the left sacro-iliac symphysis to the right acetabulum,* so that the proportion of the latter position, is only *one* in every *two hundred and ninety-one* cases. In eight of these the occiput was looking *forwards,* and in four *backwards.* He further states that in 2262 cases the face was directed backwards to the *right sacro-iliac symphysis,* and in 1217 forwards *towards the left acetabulum;* so that in rather more than one third of these labours the face was originally directed *diagonally forwards.* Simpson (Obstetric Memoirs, vol. i., p. 456,) says that in " ninety-nine out of every hundred cases of cranial presentation, the long diameter of the head is found placed, at the commencement of parturition, in the right oblique diameter of the brim, which in the living subject is the longest." He states also that the tables of the Maternity Hospital at Edinburgh, show that the face presents to the *left acetabulum once* in every *four* labours, whilst in private practice, he has noticed it to occur *once* in *between every three and four.* This proportion accords with the observations I have myself of late years made. Simpson also calculates that when the face is situated diagonally forwards at the beginning of the process, it will turn into the hollow of the sacrum before expulsion in *twenty-nine* cases out of *thirty.* The reason assigned by him for the enormous preponderance of cases where the head is found, at the beginning of labour, with its long diameter in the *right* oblique diameter of the pelvis—in a line running from the right sacro-iliac symphysis to the left acetabulum—seems to be, because, in the *left* oblique diameter, " its length is curtailed by the presence of the rectum." This is rather too mechanical an explanation to be followed stringently; for the position of the head is, no doubt, determined before the *os uteri* opens, and consequently before the head can be influenced by any impression made upon it by the space which the rectum occupies, either at the brim or in the pelvic cavity. If, as Simpson avers, the *right* oblique diameter in the living woman is the longest which the pelvis possesses, the alleged frequency of the long diameter of the head being applied in this direction, may be referred to those unerring laws by which Nature so admirably adapts the means she employs to the ends she has in view.

I have before, at p. 109, stated, that in the earlier part of my professional career, I was impressed with the belief, for reasons there given, that the position of the head with the face opposite to either ilium,—the long diameter of the cranium tallying with the direct transverse diameter of the pelvic brim,—was very common; but that more extended observation had convinced me that in these cases the original position had been with the face towards one of the acetabula—that it had commenced its rotation backwards—had been arrested in its transit; and that the head had become fixed in that position, without being able to perfect its turn. And this I judged from the manner in which the chest of the child escaped after the head was in the world. For it is evident that if the anterior part of the thorax and abdomen be expelled pressed against the rami of either ischium and pubis, after the face had transversed the hollow of the sacrum and perineum, the original position of the face must have been diagonally forwards, the great part of the body of the child not following the turn which the head had made in emerging. By attending, therefore, to the mode in which the trunk passes, we may inform ourselves of the position which the child held in utero, and of the original direction of the fœtal face. In the cases that I allude to, I found the face by far most frequently directed to the *left* ilium.

It has often been a subject of astonishment with me, when the face has been expelled along the sacrum, and the fore part of the chest has escaped under the ramus of the ischium and pubis, that no injury was sustained by the child from the twisting of the neck, which, it would appear, must take place; but it seems to great repute have denied the possibility of such an occurrence.* From my own observation, however, I am perfectly satisfied that both these presentations occasionally do take place. Under this position the head is placed with its longest diameter in the direction of the shortest diameter of the pelvic brim; and if the head and the pelvis be of average dimensions, it is impossible for the head to occupy the cavity, unless a change in situation either occurs spontaneously, or is effected artificially.

Diagnosis. — In this case the vertex is observed to lie high up at the brim of the pelvis, almost out of the reach of the finger, as introduced in a common examination. But although, from the difficulty in feeling the presenting part suspicion may be excited that the position is irregular, the peculiar nature of that irregularity will probably not be determined until after the membranous cyst has given way. On the second stage of labour, however, having commenced, — following the general directions before laid down, — it is right that an accurate examination of the head, and of its bearings in relation to the pelvis, be made, and we shall find the sagittal suture running from before directly backwards, and not laterally or diagonally. We may then be assured that the face is looking either towards the promontory of the sacrum or symphysis pubis, and positive knowledge on that point will be afforded by the situation of the anterior fontanelle. In relation as this fontanelle is directed backwards or forwards, so will the face be situated.

I have no doubt that this mal-position is in many instances rectified by nature herself; that (the force of the uterine contractions being resisted, by the approximation of the pelvic bones in their conjugate diameter, which do not afford due and proportionate space for the descent of the head thus placed) the mechanical impediment offered occasions the head to turn, with the face to one or other side, on the same principles that regulate the turn which is observed to occur in all natural cases, just before it escapes externally. There is no more difficulty in believing that such a change of position is likely to happen at the upper than at the lower pelvic aperture.

Being satisfied, then, of the situation of the head after the membranes have broken, having watched the effect of two or three pains, and observing that it evinces no disposition to accommodate itself to the dimensions of the pelvic brim, it is proper,— lest the woman become worn out by inefficient struggles, and lest the cranium become wedged in this unfortunate position—to follow

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bear this very considerable rotation with perfect impunity; and the probability is, that it is not the neck only which is twisted to permit the head to turn, as described; but that the whole vertebral column participates in the torsion, while the child's head is passing,—to recover its natural straightness as soon as the head is liberated.

* See p. 110.

nature's dictates, and incline the face laterally. This alteration in situation it would not be difficult to effect, by grasping the head between the three first fingers and thumb introduced into the vagina, provided the os uteri were well dilated, the vagina and perineum sufficiently relaxed, and the head remained above the brim, perfectly moveable, free, and unimpacted. On this slight alteration being made, the head will enter the pelvis, all the difficulty will be over, and the case will be reduced to one of the most ordinary character. If, however, we cannot accomplish this object, let us then be guided by the general rule—to which there is no exception—that of waiting till either the lapse of time, or symptoms of danger, require instrumental interference.

Brow Presentation.—Other parts of the head besides the vertex may present. The anterior fontanelle, or brow, may be the depending part; and under this presentation the face may offer itself at the pelvic brim, looking to one ilium or the other—obliquely backwards to either sacro-iliac synchondrosis—obliquely forwards to either of the groins—directly forwards to the symphysis pubis—or directly backwards towards the promontory of the sacrum; in the same manner, indeed, so far as regards the points of the pelvic parietes, as though the vertex presented.

Under either of these mal-positions, the head is still less adapted to the passage than when the vertex presents with the face forwards, since much greater space is required for its transmission. It has been shown in plate vii. that the same cranium, when the brow or face is directed first, requires a space of nearly an inch more in the longest diameter, than when the vertex is protruded.

Brow Presentation; the face looking diagonally backwards.—In all cases where the anterior fontanelle offers itself originally, there is a natural inclination for the case to be converted into a perfect face presentation; and this is owing to the fibres of the fundus uteri exerting themselves strongly upon the fœtal body; under which action the shoulders are pressed downwards, the chin is gradually separated more and more from the chest, and the head is expelled in the manner hereafter to be described.*

It is very probable that the presentation of the anterior fontanelle may be detected before the membranes rupture, because of its quadrangular figure, and because of the large space it offers to the finger: but even should this information be obtained thus early, little can be done towards rectifying the position until the liquor amnii is spontaneously evacuated; since, under any attempts we might use, we should almost unavoidably destroy the

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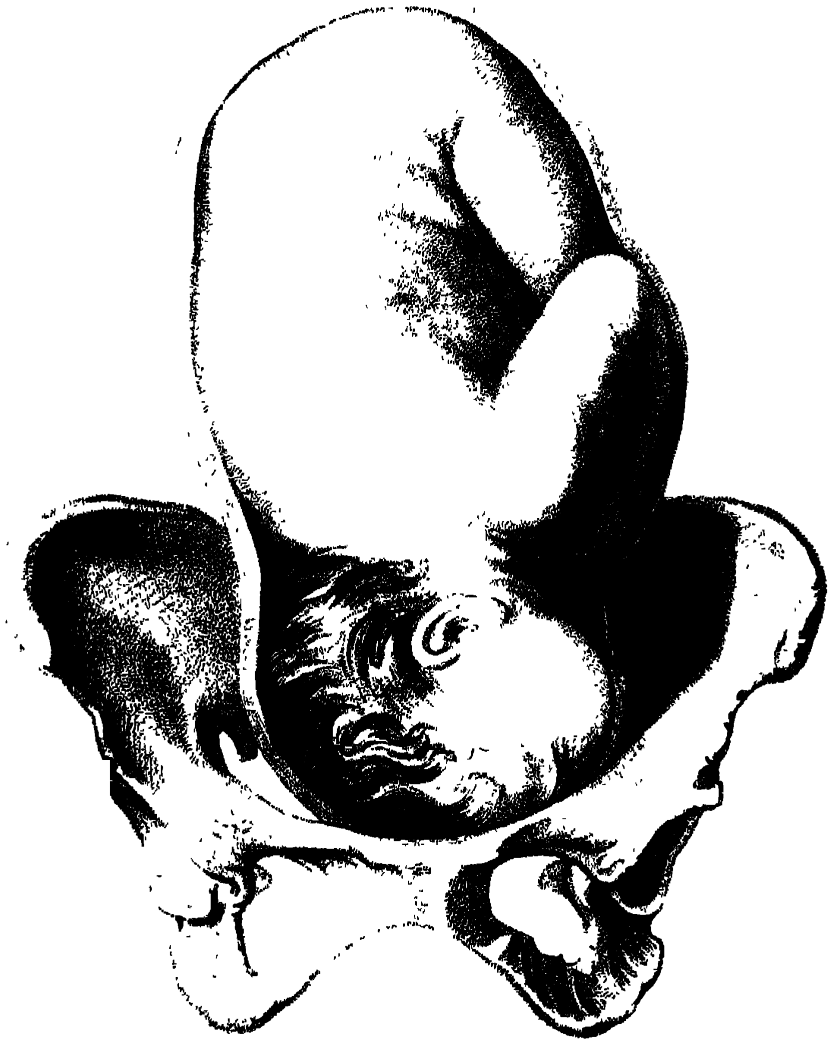
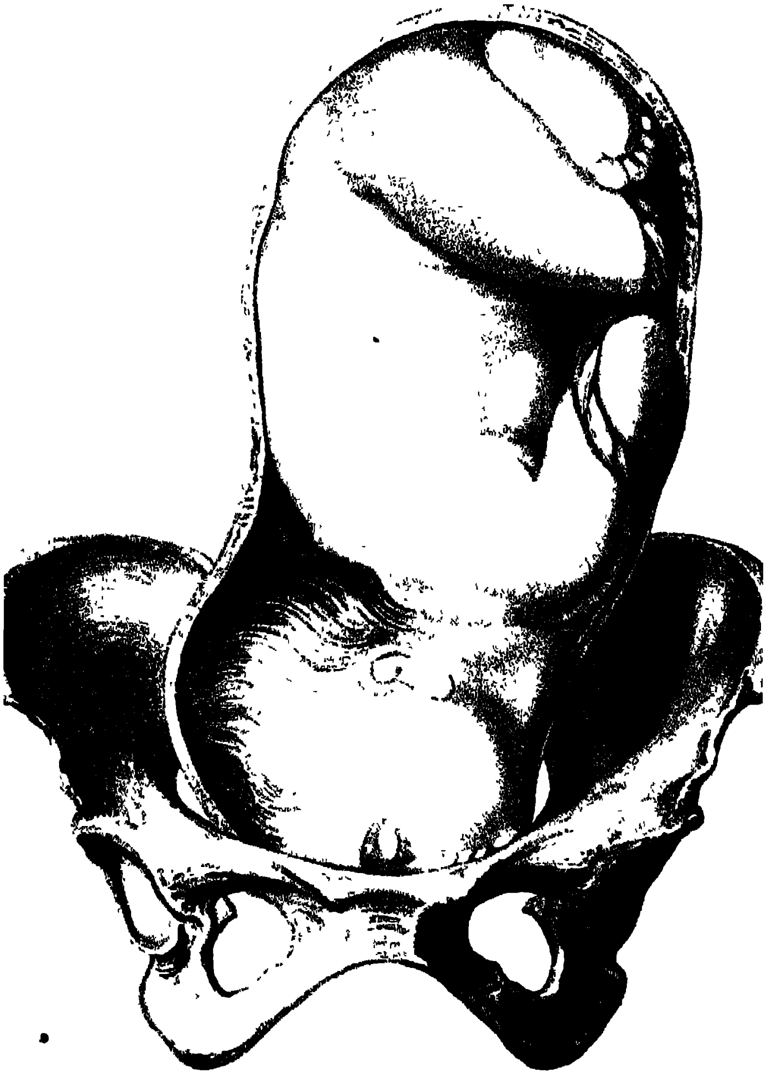
* If plate 44, which represents a presentation of the brow, with the chin to the left sacro-iliac synchondrosis, be compared with plate 45, in which is depicted a face case with the chin to the left ilium, it will be easily seen how the power of the uterine contractions tends to convert a brow into a complete face presentation.





integrity of the membranous cyst, which it is of such essential importance to preserve whole. It is necessary that the case should be watched carefully and narrowly; and on the rupture of the bag, an accurate examination should be instituted, with the view of determining whether the face lie forward, backward, or laterally. In the case now under consideration, the sagittal suture, which becomes our guide, is traced from the anterior fontanelle, running obliquely forwards and upwards to one groin or the other. There can then exist no doubt, first, that the anterior fontanelle presents; and, secondly, that the face is placed backwards in relation to the pelvis.

Inasmuch as a considerably greater space is required under a presentation of the brow than when the vertex depends; inasmuch as there exists such a disposition to convert the case into a face presentation; and inasmuch as the labour is usually protracted, and attended with a proportionably increased degree of pain; it would naturally follow that we should endeavour to place the head in a more favourable position, by throwing the chin more upon the chest, and causing the vertex to descend; provided this could be accomplished without incurring danger, without any aggravation of suffering, and without the formidable appearance of preparing for an operation. This object can frequently be gained, if the position be detected soon after the rupture of the membranes, and before the head has perfectly engaged in the pelvic cavity, by a very simple and easy method: it only requires that steady pressure should be made upon the brow with the extremity of the finger during the urgency of pain, so that the forehead may be arrested at the spot to which it has attained, and the powers of the uterus be expended upon the back part of the head. It is then usually observed that the head is bent forward on the neck as on a hinge; the vertex comes down, the brow remains stationary; and thus the case may be made one of the most simple, natural, and easy kind. We can only succeed, however, in this endeavour during the paroxysm of pain: we are not to expect that we shall be able to *push* the anterior fontanelle *up above* the brim; our only intention should be to prevent its passing *down further*, and to give an opportunity for the back part of the head to occupy the pelvis more completely. If this counter-pressure be made with caution, tenderness, and judgment, it can do no harm, and may be productive of much good.

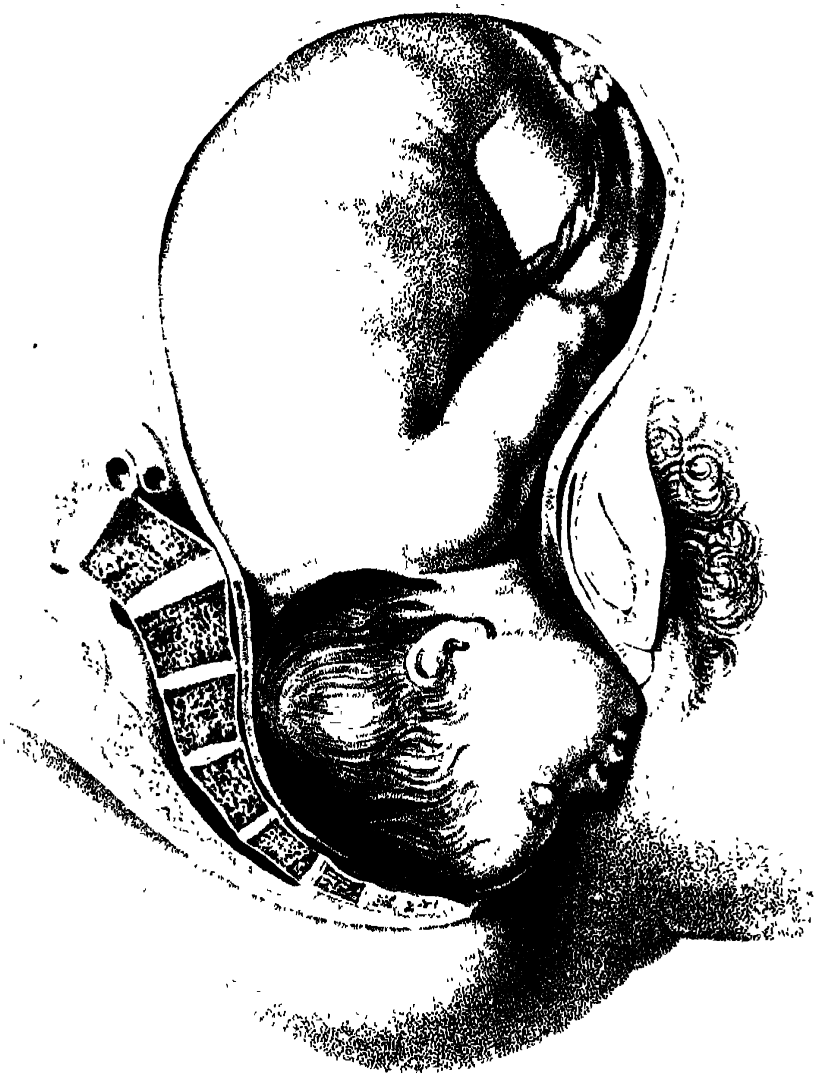
Brow presentation, with the face forwards.—The anterior fontanelle may present with the face looking forwards to one or other groin; and this position is even more unfavourable than either of those just described; because not only is that part of the head presenting which in itself requires a considerably increased space, but it is placed in a very awkward situation as regards the pelvis.

There is the double disadvantage of a brow presentation, and the face being directed forwards. There can be but little difficulty in detecting this position, at any rate, after, or even previously to, the rupture of the membranes: the anterior fontanelle is easily discriminated, and the sagittal suture can be traced running obliquely backwards and upwards, until it terminates at the superior angle of the occipital bone, in the direction of one of the sacro-iliac symphyses.

The same remarks just made respecting the propriety and necessity of giving a new inclination to the head, apply with equal truth, and even more force, to the variety now under contemplation. There is the same chance of the case being converted into a face presentation,—the same likelihood of a protracted termination;—and we possess almost an equally easy and effectual method of rectifying the unfortunate position. Counter-pressure, during the time of pain, will here also avail us much; not, however, directed on the centre of the brow, but on one side, just above the temple. We may often succeed in preventing the chin passing downwards, in making the vertex the most depending part, and in throwing the face a little backwards. If we can cause the head to move in the slightest degree, so as to direct the forehead opposite the iliac fossa, we shall find that nature will eventually turn it with the face into the hollow of the sacrum. Should these attempts, however, not prove successful, the head may be embraced between three fingers and a thumb, and a rotatory inclination given to it; the proper change can thus generally be effected, unless, indeed, some time has elapsed since the membranes broke.

The presentation of the brow with the face directed towards the promontory of the sacrum or the symphysis pubis, is even more unusual than the same direction of the face, the vertex presenting; there will be equal or even more difficulty in its passage through the brim; the same means must be taken to detect its situation, and the same attempts used to place it in a more favourable one.

Face Presentation.—I am inclined to think that most of the face presentations which we meet with in practice were originally brow presentations, and have been changed by the action of the uterus in the way I have already specified: however, there is no question that the face sometimes offers itself even at the onset of labour. Various are the positions in which a fœtus, when the face presents, may be placed; but this is the most common. The crown of the head is directed to one ilium, the chest towards the other, and a shoulder towards the spinal column and abdominal muscles respectively. (Plate 45.) As the case progresses, the face descends down into the pelvis, until the summit of the head im-



pinges on one ischium; and the chin on the other. The resistance then met with from the ischial bones, causes the direction of the head to be totally altered. The chin gradually turns forwards, and appears under the arch of the pubes; the neck and chest being arrested behind those bones, the force of the uterine contractions is expended on the upper and back part of the head; the occiput consequently sweeps along the sacrum and perineum, the head moves forward on the hinge of the neck, and on its emerging, the chin is the first part delivered—the occiput the last. (Plate 16.) This change will, I believe, always take place, unless the child's head be very small relatively to the size of the pelvic cavity. I myself never knew an instance of face presentation, in which the head was expelled with the upper and back part emerging from under the pubic arch.* A face presentation requires even more room than any yet discussed; and if it be a first child, it is generally attended with great difficulty and distress; but if the parts be well relaxed—if the pelvis be good, and the pains strong—as a general principle, face presentations will be terminated with little or no assistance.

Mode of detection.—It is not very difficult to detect a face presentation, even before the membranes break; or rather, it is easy to determine that no part of the cranium, properly so called, presents; for the face is readily distinguished from the harder parts of the head. On making an examination, an irregular, soft body meets the finger, which, unless we are careful in our inquiry, we may possibly mistake for other parts of the child. The face has not unfrequently been confounded with the breech—of which I have known more than one instance; the cheeks have been taken for the nates and the mouth for the anus. The prominence and regularity of the features will necessarily be our discriminating marks. Thus we may feel the nose about the centre; the two eyes above; the chin below; and the mouth, differing from the anus in shape, size, and in possessing lips;—the gums and the tongue can often be felt, also, after the liquor amnii is discharged; and then doubt can exist no longer. Besides these sufficiently striking features which indicate the face, the breech possesses certain distinctions of its own, to be hereafter particularly noted. If we are satisfied with simply placing our finger against the puffy cheek, we are very likely to fall into error; but we are not to form an opinion by one part alone—we must take all the points that we can reach as diagnostic signs.

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* Meigs gives an illustration in which a child, under a face presentation, is passing with the chin sweeping the sacrum and perineum; and details a case in point. (Obstetrics, p. 338.) Dr. Lee also (Lectures on Theory and Practice of Midwifery, 1844, p. 260) gives a cut describing the head in the pelvis, with the chin and under part of the lower jaw occupying the sacrum. As I have said in the text, no such case has ever come under my observation.

It becomes a most important question, whether under a face presentation any means should be adopted to place the child in a more favourable position. So difficult, and almost impossible, was the transmission of the head under this presentation (as well as some other of these irregularities) at one time thought,* that it was recommended that the hand should be introduced into the uterus—that the feet should be laid hold of, and that the child should be delivered by *turning*. This operation performed under the most favourable circumstances, is always attended with great pain, and frequently with great danger—danger both to the mother and the child;—to the mother, from the chance of injury to which her structures (particularly the uterus) are exposed—to the child, in consequence of the pressure which the funis umbilicalis must more or less experience, when the shoulders and head are passing through the pelvic cavity. All these circumstances, then, being taken into consideration, the practice of changing the position of the child under a face presentation, by *turning*, is now almost entirely exploded; and we rather leave the case to nature, so long as we can safely trust her, than subject the woman and the infant to such dangers.

But suppose, on watching the case, we find no advantage gained—no alteration in the position of the head—no advance from hour to hour—what then is to be done? We must here also act upon the same unerring principles before laid down, wait till symptoms require our interference, and then use that instrument which seems most applicable to the emergency. For it is impossible, by any counter pressure, to make a beneficial change in the situation of the head under a face presentation. We cannot cause the head to turn upon the neck, so as to approximate the chin to the chest, by pressure applied by the finger; nor can we, indeed, succeed in producing the same alteration by the introduction of the hand over the vertex, the adaptation of the points of the fingers to the occiput, and the application of gentle traction: as some have recommended.† The vectis, then—provided any instrument be required—will be found the most appropriate. Face and ear presentations, indeed, appear to me the only cases in which the forceps does not possess an absolute superiority over the vectis.

The features of a child born under a face presentation are generally much swollen, turgid, and livid. We must be prepared, therefore, to expect some disfigurement; which, however, will generally disappear in two or three days.‡

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* See Dewees, Mid., par. 654.

† Baudelocque, par. 1337, transl. advises this method of rectifying the position, before the head has engaged in the pelvic aperture. See also par. 1870.

‡ Meigs (Treatise on Obstetrics, 1852, p. 393) judiciously recommends the young

EAR PRESENTATION.—Ear presentations are by far the most rare of any of these irregular positions of the head. Either side of the head may present; the face may look to one ilium or the other, or to the pubes or the sacrum.

As illustrative of the mechanism of ear presentation, I will suppose a case in which the face is looking backwards; in which the summit of the head is directed to the right ilium, and the left shoulder impinges on the left ilium; and in which the ear meets the finger, immediately on being passed up to the pelvic brim. (Plate 47.) In this position, provided the head clears the brim, it is usually propelled into the pelvis in proportion as the trunk of the child advances, until it comes to press low down upon the outlet; but in consequence of its being doubled sideways on the shoulder, the space required for its exit thus is more than the inferior pelvic aperture affords, and before it can escape it must necessarily take a fresh direction: a change in situation, therefore, is effected;—not, indeed, a semi-rotatory turn, such as the head describes under the presentation of the vertex, but the summit of the head passes downwards; the joints of the cervical vertebræ allow the neck to become nearly straightened; the face is by degrees thrown into the hollow of the sacrum; and the occiput is turned up under the arch of the pubes. If the face is looking forwards above the symphysis pubis, the case will be surrounded by increased difficulties, the face being expelled under the pubic arch; nevertheless these remarks are generally applicable to all ear presentations.

Mode of Detection.—There can be little difficulty in detecting an ear, or in determining how the head lies, with reference to the pelvic brim, when we touch it. There is no part of the fœtal body we are likely to confound with the ear. We can feel the different parts of the organ itself, and the bony head surrounding it. We can distinguish the helix or flap, and the tragus or sessile part; we know that behind the helix is situated the occiput, and anterior to the tragus, the face; and these points will immediately lead us to determine the true position of the head as regards the pelvis.

Having, then, detected the ear, and ascertained the situation of the head, three modes of proceeding offer themselves for our choice. We may either turn the child and extract it by the feet; or we may endeavour to bring down the vertex; or, leaving the case for some time to nature, we may hope that the head will gradually assume a more favourable direction. Doubtless there are particular cases to which each of these means may be applicable; but, upon the whole, the observations I have just made

practitioner to warn the friends, before the child is born, of the probability of this disfigurement, lest it should be imputed to some improper conduct on his part.

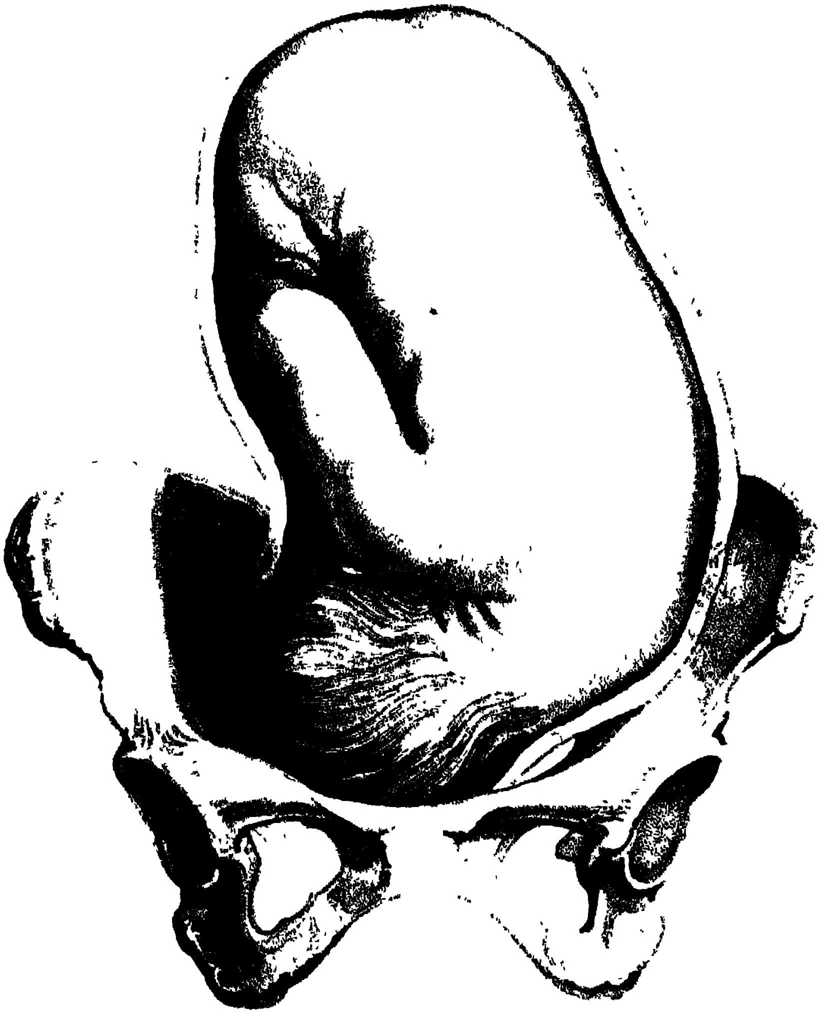
regarding the management of face presentations are equally valid in this case. Turning is not generally required, and should not be thought of, if the uterus be strongly contracted round the child's body; no good can be effected by counter-pressure; I cannot see what advantage could be gained by the introduction of the fingers over that side of the head which lies uppermost, even if they could be passed up without difficulty; and it is certainly not necessary to interfere instrumentally, merely because the ear presents. The common principle must here direct us; we must wait patiently, in the hope that nature will effect her object; and should the head remain stationary for some time, or should constitutional symptoms of distress supervene, delivery must be effected instrumentally: and that may probably be accomplished by the vectis.

DIFFICULT LABOUR.

THE second class of labours, DIFFICULT or LABORIOUS, embraces two orders, *lingering* and *instrumental*.

LINGERING LABOUR.—I have defined a *lingering labour* to be a case in which the head presents; which occupies more than twenty-four hours from its commencement to its termination; which is concluded without the necessity for instrumental or manual interference; during the progress of which no dangerous or unusual symptoms manifest themselves; and in which nothing calling for anxiety occurs, except the length of time that elapses under its continuance: so that it differs only from a natural labour in respect of its duration.

We sometimes hear of a woman being in uninterrupted labour a week, ten days, a fortnight, or even longer. Such an idea is perfectly absurd; the powers of the system could not bear up against the exertion of labour for so protracted a period. Besides which, the active agents could not support their operations for so long a time: for the uterus obeys the general laws of muscular action under parturition; its powers become gradually enfeebled under a continuance of excessive toil, and it is at last entirely disabled through exhaustion: with the cessation of its action, the process of labour is also at a stand. This is exactly analogous to what we observe daily and hourly in all muscular structures: when fatigued, they contract feebly and unwillingly; and when their powers are exhausted they can exert themselves no longer. Such cases, then, of reputed prolonged parturition, are dependent on false, irritable, spasmodic pains, situated in some other part of the body; by which, as we have already learned, women are



frequently harassed towards the close of gestation; but which are perfectly unconnected with, and independent of, contraction in the uterine fibres.

In estimating lingering labours, we calculate from the first commencement of true uterine action; but in estimating the length of labour, in reference to the patient's strength, and its effects on her system, we principally take into consideration the time that has elapsed since the membranes broke; for it is reasonable to infer that no great exertion has been sustained—consequently that little or no exhaustion has appeared: and particularly, that scarce any injurious pressure can have taken place on the soft parts within the pelvis, while the membranous cyst remained entire: provided there be an ordinary quantity of liquor amnii. Thus, when called to a case of lingering labour, in considering the chance of injury from its duration, our mind should be directed, not so much to the interval which has elapsed since the first accession of uterine pains, as to the time at which the membranes ruptured; and that should be looked upon as the period when it was possible for dangerous pressure to have commenced.

CAUSES.—Many and various are the causes which may produce a protracted labour. They may be arranged under two distinct heads—those which are referable to the mother,—and those in which the ovum is at fault. The causes referable to the mother are—

First, the want of sufficient power, or the absence of sufficient energy, in the uterus itself;

Secondly, the want of sufficient room in the bony pelvis, to admit the ready passage of the fœtus;

Thirdly, the presence of one or more tumours in the pelvic cavity;

Fourthly, rigidity of the os uteri, vagina, and perineum—one of these organs being affected singly; or a combined rigidity of the whole tending to retard the progress;

Fifthly, a cicatrix, or membranous impediment, existing in the vagina;

Sixthly, obliquity of the os uteri;

Seventhly, a distended bladder; and,

Eighthly, the presence of a vesical calculus.

Those causes of lingering labour referable to the ovum are said to be—

First, Preternatural toughness of the membranes;

Secondly, the head being larger than common, from natural healthy formation, deformity, or disease;

Thirdly, the head being too strongly ossified, though not of larger dimensions than ordinary;

Fourthly, mal-position of the head;

Fifthly, ascites or tympanites of the fœtal abdomen;

Sixthly, the umbilical cord being unnaturally short, or being twisted around the body or limbs of the fœtus;

Seventhly, unusual bulk of the trunk or limbs; and,

Eighthly, monstrosity.

Some of these causes in which the child is at fault, exert a great influence over the duration of labour; while others possess no power whatever in retarding the process, as far as the head is concerned.

INEFFICIENT UTERINE ACTION.—Labours rendered tedious, or lingering, from this cause, are generally observed in constitutions debilitated by previous disease, by excessive discharges, or some other depressing action. We constantly remark, also, that the uterus acts feebly when the woman has previously borne a large family. In this latter instance, indeed, the organ does not obey the laws of muscular action; for the more frequently muscles are called into powerful contraction, the stronger they become;—the uterus, on the contrary, usually displays less energy when its peculiar powers have been often exerted in childbirth.

This cause of lingering labour is known by the pains being weak; the intervals at which they succeed each other distant; the space of time during which they continue short;—while, at the same time, there probably exists a good pelvis, and a sufficient degree of dilatation and laxity of the passages to allow the escape of the fœtus, provided the propelling powers were adequate to that end. In some cases, where the delay is attributable to inefficient uterine power, the sanguiferous system may also be acting with diminished force; and there are perhaps other symptoms present, indicative of general debility. It is not likely that we shall find much difficulty in detecting this cause of lingering labour.

Treatment.—Under these circumstances, it becomes our duty to endeavour, if possible, to rouse the uterine energies; by doing which we may probably prevent the necessity for instrumental delivery. This object we can sometimes easily effect. The pains may be augmented both in frequency and strength, and may even occasionally be restored after they have been suspended for many hours;—by warm diluent drinks;—by stimulants taken into the stomach;—by particular medicines;—by friction and other external means;—and by a change of posture.

Of all the methods employed for the purpose of increasing inefficient, and restoring declining pains, none are more frequently had recourse to, and none are less injurious, than warm diluents; they are the simplest that can be used, and are often successful. It is very common for the nurse, when the uterine contractions are weak, short, irregular, and distant, to propose that some gruel or tea should be given "to bring back the pains." If such nourishment be grateful to the patient, if there be no tendency to vomit, or if she feels to desire it, there can in few cases be any objection to the exhibition of warm diluents; and they may be given almost *ad libitum.* To stimulants, as a general principle, under labour, I am decidedly adverse; and consider it as a maxim never to allow them, unless some degree of faintness be present; or a languid state of the general system indicate their propriety: because the excitement they cause must be followed by a corresponding depression; and they may tend either to induce fever, or hurry on exhaustion. Before stimulants are exhibited, many things must be taken into consideration: such as the state of the pulse and skin; the length of time the labour has lasted; the strength of the pains; the degree of faintness the patient is suffering; and the kind of discharge. Should the pulse be weak and slow, the surface colder than natural, the uterine contractions powerless, and the system depressed, while at the same time there is no blood flowing through the vagina, nor any indication of internal and concealed hæmorrhage, stimulants are called for; and either the domestic or medicated may be allowed.

Various specific medicines have been recommended at different times, to increase the parturient throes, and facilitate the child's birth; but I believe that the whole of these substances, one only excepted, act upon the womb through the excitement induced in the arterial system. They first stimulate the nervous, then the arterial, and through the medium of those systems, the uterus. Almost the only medicine now used as a uterine excitant, is the *ergot of rye:* and I have no hesitation in declaring my opinion that its action is specific, and that the uterus is not affected through any disturbance first set up in the arterial system.*

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* The secale cornutum, ergot, or spurred rye, is the produce of a disease in that plant, with which one or more of the grains in different ears are simultaneously affected. When attacked with the "spur," the corn first becomes softish and pulpy; and soon bursting from its husk, obtains solidity, and assumes a lengthened form, slightly curved, and pointed at the extremity; its hue is in the first instance red, but it soon changes to a dark violet or blackish colour. The diseased grain varies much in length, sometimes being perfectly concealed within its husk, at others growing to nearly an inch and a half; its usual length is about an inch, and its general appearance resembles much the spur of the cock. As we obtain the grain, it is brittle, and breaks with a crisp, irregular fracture, somewhat like a dried almond. On being divided, it is seen to consist of a dark cortical and internal bluish white substance; it has no heating qualities, is not unpleasant to the taste, but possesses a slight mawkish flavour. Almost all the grains, and many of the other grasses, are subject to this affection (Pereira's Mat. Med., ed. i. p. 597); but it is most usual in rye, and most frequently taken from that plant for medicinal purposes. Wet seasons are particularly favourable for its production; it is sometimes observed in this country, but is more common in Switzerland, the south of France, and in North America. The

The drug has been exhibited in various forms, chiefly in powder, infusion, decoction, and tincture. The two first are in my opinion the best modes. If given in fine powder, about twenty grains is the proper dose; but I am myself generally in the habit of using it in infusion. Two drachms may be infused in four or six ounces of boiling water for twenty minutes; a fourth part of the strained liquor should be given at a time, and under labour the dose may be repeated every quarter of an hour, until either its action becomes apparent, or the whole is taken; for I consider it useless to persevere with the medicine, if the quantity mentioned produces no effect. I have found that if the infusion be allowed to stand much longer than the time specified, it acquires a nauseating property which greatly distresses the stomach. Desgranges* used only the black cortical part, in which he considered its active principle to reside: he gave it in doses of four or six grains, which he found as efficacious as thirty grains of the whole powder. Villeneuve administered it in *lavements;* and he considers this the most efficacious means of employing it, provided there be present much irritability of the stomach.

I have given the ergot, in the doses recommended, every four or six hours, for many successive days, on several occasions, and never knew it produce any bad effects upon the mother, except occasionally nausea and vomiting. Usually there is no more influence perceptible on the general system than would be observed after taking a cup of tea; but its effects upon the uterus in labour are often speedy, powerful, and astonishing. Its action mostly commences within fifteen or twenty minutes after its exhibition; and the character of the pains induced through its agency differs materially from the ordinary throes of parturition; so that it is possible in many cases to distinguish them, as being actually produced by the drug itself;—they are stronger and more constant than the common pains of labour. When the ergot has obtained full power over the system, the uterus will frequently act without any decided intermission for many minutes together;—there being only a slight remission observed—no interval of perfect ease. This remark has been made by Ingleby† and other physicians; and I have had myself an opportunity of observing its truth on many occasions.

As the ergot undoubtedly possesses such a strong influence

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disease destroys the germinating power of those particular seeds which are attacked with it, but does not affect the sound grains in the same ear. The ergot in fine powder is of a perfect ash colour, and its infusion of a dingy violet.

* Neale on the Ergot, p. 42.

† On Uterine Hæmorrhage, p. 79. See also Pereira's Mat. Med., p. 602; and Murphy, Lectures on Midwifery, p. 141. Meigs (Treatise on Obstetrics, p. 674) says a uterine pain caused by the ergot "may last twenty minutes, or even half an hour, without a moment's suspension."

over the uterine system, it is evident that, if exhibited improperly, it is likely to do much injury, and that it must be used with great discrimination.

There are many cautions, then, as well for the child's sake as the mother's, necessary to be attended to in adopting and employing it. Its exhibition must not be thought of in any case where a disproportion exists between the head of the child and the pelvic cavity; we should incur great danger of inducing contusion, inflammation, and laceration. Neither must it be exhibited where there is any disposition to rigidity of the parts,—either the os uteri, the vagina, or the perineum,—through fear of the same dangers. As a principle, it is not usually necessary in first children, and therefore this is a case in which we generally should make an exception. It must not be given in any case where the labour is rendered lingering by a mal-position of the head. It may be admissible occasionally in breech presentations; but in no case of transverse position of the fœtus, provided the term of gestation is nearly completed, should we ever contemplate administering the ergot, at least not until after *turning* was accomplished. It might then indeed be had recourse to with advantage, provided the uterus was acting sluggishly, to insure a more perfect state of contraction in the organ. Under a head presentation it must only be exhibited where the sole cause of delay is a torpid or feeble state of uterine action; or where it is desirable to terminate the labour speedily, in consequence of hæmorrhage. I have found it very useful in accidental hæmorrhage after the membranes have been ruptured, as well as in cases of *placenta prævia;* in loss of blood under abortion also, where it was impossible to empty the uterus by manual operation; and where the patient would perhaps have sunk from a continuance of the bleeding.

But although I am perfectly convinced of the powers which the ergot sometimes displays under parturition, I am by no means inclined to agree with those practitioners who think that this medicine will entirely supersede the necessity of any other means being adopted in lingering labour. I cannot coincide in the opinion expressed by Mr. Michell,* that its general introduction will so completely supersede the use of the forceps, that "he would not be surprised if in twenty years that instrument should be known only by name." Nor in his remark, "that except in the rare cases in which the Cæsarean operation was formerly recommended, he conceives there will now be no occasion for instrumental aid in midwifery."

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* On the Ergot of Rye, 1828, p. 56. For a brief history of the ergot, and some objections urged against its use, as well as a notice of the dangers to which the child is exposed, when the patient is brought fully under its influence, see Appendix C.

Authors vary much in the statements they furnish of their success with this grain. This discrepancy may partly be accounted for by the ergot, in those cases where it produced no impression, not being fresh; since, by being kept too long a time, it loses its virtue.* It may also be owing partly to the constitution of the patient not being susceptible of its peculiar action. We know that some persons are not susceptible of the peculiar action of mercury; and we may easily believe that in the same manner some constitutions may be insusceptible to the peculiar action of the ergot of rye.†

Borax was held by the ancients in high estimation as a promoter of uterine action. It fell, however, completely into disuse, till its supposed virtues were again brought into notice by Hufeland.‡ And the late Professor Lobstein more recently recommended it in a communication addressed to the Société Médicale d'Emulation de Paris.§ The quantity he employed was five or six grains every half-hour. Rigby‖ also speaks of it in terms of praise; he says its efficacy has long been known in Germany. He combines ten grains of the salt with a scruple or two of powdered ergot, and exhibits it in cinnamon water. I cannot say that the few trials I have made of it would lead me to think favourably of its powers.¶

External means are sometimes had recourse to for the same purpose. Warmth, applied by hot flannels to the hypogastric region, to the legs, the thighs, and the back has been tried, but has seldom been found efficacious in restoring uterine action, unless there also existed at the same time depressed arterial energy, or a cold surface. Under such circumstances, we should not only apply warmth externally, but give warm diluents, or perhaps stimulants. Pressure and friction are found to possess greater power over the uterine fibres than warmth externally applied. The pressure of a bandage, or the hand, will often excite the uterus to increased action both before and after the birth of the child. It will be shown, that in cases of hæmorrhage after delivery, dependent on a flaccid state of the parietes of the womb, we possess no more serviceable means to ensure their permanent contraction, than the application of pressure by the grasp of the hand; and although pressure acts more energetically upon the uterus when the organ is more or less emptied of its contents, —especially after the birth of the child,—yet firm, steady pressure will sometimes excite it to more vigorous contraction, even while it contains the fœtus within its cavity. Friction with the open palm previously to the child's expulsion is more frequently had recourse to under this kind of lingering labour, than more simple pressure, and a most efficacious agent it sometimes proves.

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* I know scarcely any medicine that spoils more rapidly by keeping, or that requires greater care in its preservation, than the ergot.

† M. Payan, of Aix, has used the ergot in paraplegia successfully. He refers its action to a specific effect which it exercises on the lower portion of the spinal marrow. He concluded, from some experiments he had made, that it did not influence the uterus alone, but the other pelvic viscera and the lower extremities also. He has frequently given it in large doses for a long continuance, without any bad effect being produced upon the system. (Journal de Pharmacie, Juin, 1812.)

‡ Journal der Practischen Arzneykunde und Wundarzneykunts, vol. xxi. p. 69; and xxiv. p. 91.

§ See Leroux's Journal de Médecine, vol. xxxvi. pp. 136 and 141.

‖ Library of Med., vol. vi. p. 209.

¶ Among the North American, as well as the Asiatic Indians, the tail of the rattle-snake has long been considered a sovereign remedy for expediting lingering labour. Clarke and Lewis, in their Voyage up the Missouri, state "that the wife of an Indian of the party being in labour, and suffering considerably, one of the Indians gave her as a remedy, some of the rattle-snake in powder, pretty much as we should give the ergot of rye." A friend of mine brought me, from Calcutta, the dried tail of one of these animals, requesting that I would test its efficacy here, giving twenty grains for a dose. I must confess I have not complied, putting as much faith in it as I would in the superstitious practice of tying a piece of tiger's skin round the woman's left thigh for the same object. For which, see Davis, Operative Midwifery, p. 77.

It appears reasonable to suppose that electrical shocks—particularly derived from the galvanic battery—would excite the flagging powers of the uterus under labour, and perhaps even induce action *ab initio*.* This is a means, however, of which I have myself never made a trial; and I only judge by analogy, in consideration of the influence the electrical fluid exerts over the nervous system generally, and through that system, over muscular fibre.†

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* In Busch's Neue Zeitschrift fur Geburtskunde, vol. xvi. No. 3, p. 424, a case is detailed in which Drs. Hoeninger and Jacobi succeeded in bringing on labour, in August, 1844, by the electro-magnetic apparatus, after other means had failed. The application was immediately followed by uterine action; and the child was born in an hour from the commencement of the operation.

† Since this sentiment was published by me, in my Lecture in the Medical Gazette, April 19th, 1834, various trials have been made of the efficacy of galvanism in exciting increased uterine contractions. I was not then aware that the same means had been suggested by Herder (Diagnostische Praktische Beitrage zur Erweiterung der Geburtshulfe. Leipzig, 1803). Dr. Radford, in a lecture delivered at the Manchester Lying-in Hospital, on December 10th, 1844,—on galvanism applied to the treatment of uterine hæmorrhage,—speaks of it in highly laudatory terms, as a means of producing "effective and powerful contraction of the uterus," as he himself had witnessed: and in the Medical Gazette for June 27, 1845, p. 376, Mr. Cleveland details a case of labour rendered lingering from inertia of the uterus, which was brought to a close within a quarter of an hour after the use of the electro-galvanic apparatus had been commenced. Cases are given in confirmation of this view by Dorrington (Prov. Med. Surg. Journ., March 11, 1846), Wilson (Ib. April 9, 1846), and White (Dublin Hosp. Gaz., March 1, 1848).

In consequence of Dr. Radford's observations, Professor Simpson, with his accustomed zeal in the cause of medical science, undertook some experiments "for the purpose of ascertaining, as far as possible, the exact degree of influence which galvanism possessed over the contractile action of the uterus during labour, and, consequently, the amount of aid which we might expect to derive from this power, in any case in which we had recourse to its assistance." After trying it in eight cases, the professor came to the conclusion—directly the reverse, indeed, of what he had anticipated when he commenced his investigations—"that, as employed at the present time, and in its present mode, it is not a means which can be in any degree relied

We may sometimes also succeed in rendering the uterine contractions stronger and more efficient by changing the patient's position, particularly from the recumbent to the upright posture; and as this is a very simple means, as it is often useful, and as the change brings her great relief, she may be advised to sit, stand, or walk, as her own inclination dictates. The effect is most probably produced by the gravitation of the head upon the os uteri.

Before concluding this part of my subject, I must repeat the caution previously given against unnecessarily rupturing the membranes during the first stage of labour. It has of late become very much the practice,—attributable in some measure, perhaps, to the recommendations inculcated by Professor Burns*—to evacuate the liquor amnii in all cases where the uterus is acting feebly; and some instances have come under my own observation, in which not only has this act disappointed the intention of the operator, but been followed, after the lapse of some time, by such symptoms as required that the labour should be terminated instrumentally. I do not mean to assert that a protracted case is always a necessary consequence of such interference; for in many instances where the os uteri is perfectly dilatable, where it has acquired a diameter the size of a crown, and especially where there is an excessive quantity of liquor amnii present, the evacuation of the water—by causing the head to bear more decidedly on the os uteri—will increase the vigour of the contractions, and bring about a more speedy termination. But I

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upon for the purpose in question; and is, so far, practically and entirely useless as a stimulant to the parturient action of the uterus." (Observations on the Influence of Galvanism in Labour, Obstetric Memoirs, vol. i. p. 390. See also Monthly Journal of Med. Science, July, 1846.) In the last American edition of this work, published in this year, Dr. Keating, who prepared it for the press, states that in 1846, some experiments were made in the Philadelphia Hospital, Blockley, on this subject, in five cases of lingering labour; and although, on the application of the wires, some paroxysmal pains were induced, they appeared more like false pains, and were not attended with any dilatation of the os uteri. The opinion arrived at was that galvanism could not be relied upon as an uterine excitant. The late Dr. Golding Bird thought such opposite opinions as these would admit of reconciliation, "founded on the opposite effects of currents as they follow the course of the centripetal, or centrifugal nerves. For an inverse current tends to produce paralysis, and a direct current contraction." (See his Lecture delivered at the Coll. of Phys., Med. Gazette, June 18, 1847.) Yet, as Dr. Simpson's experiments were performed in the same manner exactly as were Dr. Radford's, and some of them with the same kind of apparatus, it is difficult to believe that such a cause as that assigned by Dr. Bird could operate to produce such different results. Prof. Stein, about ten years ago, imagined the efficiency of the forceps might be increased by forming them of different metals, so that a galvanic action might be set up under their use; and thus the uterus might be excited to more energetic efforts. (Busch and Moser; Handbuch der Geburtskunde: Berlin, 1841. Art. Galvanismus.) Kilian held the same notions: he published, in 1839, the first case in which he used his "galvanic forceps;" but in 1845, he stated that the results had not answered his expectations. (Operationslehre fur Geburtshelfer, No. 4, 1845, p. 516.)

* Principles of Midwifery, 5th ed. p. 403.

allude to it as a generally adopted principle; and cannot but consider that such an interruption of nature's ordinances requires in practice the greatest possible judgment and discrimination.

Nor must I allow the custom of irritating the mouth and neck of the womb with the finger, and rubbing it down the back of the vagina, along the rectum, to pass unnoticed; nor that still less justifiable mode of proceeding—the endeavour to dilate the os uteri by the two first fingers introduced within it; which last means also has received the sanction of the deservedly great name of Professor Burns,* as applicable to some states of the os uteri; but which I do not feel myself warranted in mentioning except in terms of reprobation.

The practice indeed might be followed with less danger, if the cautions with which the professor has surrounded it were always borne in mind and acted on; but the chances are, that the principle alone will dwell in the memory, and little heed will be taken of the kind of cases in which it is recommended as useful.

DEFORMITY OF THE PELVIS.—The second cause of lingering labour embraces those cases in which the uterus is acting powerfully and energetically, but where there is a want of due and proportionate space in the passages for the ready exit of the child: and of these causes, *distortion of the pelvic bones*, as being one of the most frequent and difficult, claims our first attention.

Three varieties.—As in a former part of this publication I arranged pelves in general into four classes, so we may now, for practical purposes, divide distorted pelves into three varieties:—the *first*, in which the pelvic brim is so contracted as not to permit any part of the child's head to enter through it; the *second*, which has allowed the head to descend so low as to occupy the whole or chief part of the cavity, but whose outlet is too narrow to admit of its escape; and the *third*—of that intermediate size—which has permitted some portion of the head to enter through the brim, and partially to take possession of the cavity; while the principal bulk remains above. These three cases practically assume a very different character, and require therefore a distinct consideration.

First variety.—When we have perfectly satisfied ourselves, by an examination *per vaginam*, that the pelvis is so diminished in its proportions that no part of the child's head can pass through the brim, it becomes our duty not to allow the patient's strength to be undermined by the fatigue necessarily attendant upon such a labour; but early to have recourse to some means for the purpose of relieving her: because it is physically impossible for a head to be eventually expelled whole through a pelvis whose capacity in the superior aperture is so contracted as not to admit any portion of it to descend into the cavity, after the evacuation of the liquor amnii, and the full establishment of powerful expulsive pains.

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* Op. citat. p. 401. The late Professor Hamilton (Practical Observations, 1840, p. 125), by quoting Burns' opinion and practice on this subject at length, appears to adopt them as his own; and we may fairly conclude that he gives them the sanction of his authority.

Such being the case, the means to be adopted must become a most interesting and important question: and if, upon a measurement conducted with the utmost care, we find that there is less space at the brim than three inches and a half laterally, by one inch and three-eighths in the conjugate diameter; or three inches by one inch and a half; we ought to consider it our duty — however painful and appalling that may be — at once to propose the Cæsarean section, as the only means by which it is possible to save the mother's life, and as offering also the sole chance of safety to the child. If it be thought necessary that this operation should be performed at all, it ought at any rate to be undertaken before the patient's system has sunk, from a long continuance of the excessive exertion of labour. This recommendation I think it right to inculcate, in consequence of the difference so remarkable in the result of the cases operated upon in this country and on the continent. In the British isles, out of at least fifty-two operations* we have only five instances of perfect recovery on record—one in which an ignorant midwife in Ireland, named Donally,† officiated; another under the care of the late Mr. Barlow;‡ a third, where the operation was performed by Mr. Knowles,§ of Birmingham; a fourth, by Mr. Goodman, of Manchester;‖ and the fifth, by Dr. Radford, of the same place;¶ — while, on the continent, a fortunate termination has repeatedly ensued. How can we account for this discrepancy? The success on the continent, so astonishingly superior, cannot be attributed to the climate being more favourable to capital operations—to the human system being in a state to bear them better—nor to the surgeons abroad possessing either more general scientific knowledge as to the mode of performing dangerous operations, better practical adaptation of that knowledge, or evincing greater care and anxiety about the result, than obtains in England—but because either the operation has been performed early in the labour, before exhaustion has supervened; or because it has been undertaken in cases where the constitution has not been so fearfully undermined by previously existing disease. We may reasonably infer, indeed, that the more distorted the person is, the more violent must have been the affection under which the system has suffered, and the less power will it possess of bearing up against such a grievous shock as the Cæsarean section must occasion. In Barlow's successful case, the cause of the extreme diminution of the pelvis was not disease, but a fracture of the pelvic bones, from which severe injury the woman had

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* See Dr. Nimmo's Table, Edin. Monthly Journal, Sept., 1850. Since the last case there recorded occurred, four operations of this kind have been performed in London, at two of which I was present. I was invited to assist at a third, but was not able to do so, though I saw the patient before it was performed, and sanctioned the means about to be adopted. Three of these patients died within a few days of the operation; the fourth lived nearly three months. (See Discussions at Med. Chirurg. Soc., Med. Gaz., Feb. 7, 1851, p. 245; and Feb. 21st, 1851, p. 338.)

In this Table of Dr. Nimmo's, there are two mistakes: Mr. Greaves' case is noted as successful, when the patient died in three weeks; and Mr. Goodman's case is counted twice over, being also included in Dr. Radford's list.

† In January, 1738-39,—Med. and Surg. Essays. Edinburgh, 4th edit. vol. v. p. 439; reported by Mr. Duncan Stewart.

‡ In November, 1793,—Barlow's Essays on Surgery and Midwifery, p. 355.

§ In May, 1835,—Transactions of the Provincial Med. and Surg. Association, vol. iv. p. 377.

‖ In November, 1845,—British Record of Obstetrics, vol. i.; see also Provincial Med. and Surg. Journal, June 11, 1851, p. 315.

¶ In May, 1849,—Provincial Med. and Surg. Journal, August, 1849, p. 456. To the five cases of complete recovery from this fearful operation noticed in the text, two others of a doubtful character may be added,—one by Mr. Greaves, of Great

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Easton, published in the Lancet, 1833-34, vol. ii. p. 148. The account is only carried down to the eleventh day; but, from a private communication from Mr. Greaves, I learn that she lived for three weeks after the operation; "having recovered as regards the wound, &c.," she died of an epileptic seizure, of which complaint she had been the subject before her delivery. The other is given by Dr. Oldham, in Guy's Hospital Reports, vol. vii. part 2, p. 426. It was performed in that hospital, on July 3rd, 1851, by Mr. Poland, at Dr. Oldham's request. The woman was in labour at her full period, and was afflicted with *an extensive carcinomatous growth of the os uteri, the pelvis being of normal dimensions.* The report is carried down to August 11th, when it is stated that "the process of repair had gone on well, and the external wound was about an inch and a half in length, the granulating surface sloping inwards, and almost closing the uterus itself." The latter remark has reference to the mode by which the healing process was brought about. It seems that the anterior face of the uterus adhered to the peritoneum, lining the abdominal muscles in such a way that the external incision tallied with the incision through the parietes of the uterus; and through this opening the lochia continued to flow, until they ceased to be afforded. I have not met with any official account of the sequel of this case; but in the Medical Times for October 18, 1851, p. 423, there is a notice to the effect that "the poor woman, upon whom the operation of the Cæsarean section was performed at Guy's Hospital, about three months since, died lately from the progress of the carcinomatous disease, which rendered hysterotomy necessary."

Murphy, in his valuable Lectures published in 1852, quotes Churchill as his authority for the statement, that "among British practitioners, in forty cases, eleven mothers recovered and twenty-nine died, *or nearly three-fourths.*" But out of these eleven recoveries, one was a case of extra-uterine fœtation, and ought certainly not to have been introduced into this table; while of the ten remaining, six occurred either in New York or Ohio, three in England, and one in Ireland. How these *American* cases can be inserted in a table headed "Successful cases—British practice," I am at a loss to understand. These statistics are as faulty as some of Dr. Churchill's others, where he has inserted together, in the same category, for the purpose of striking an average, the *whole practice* of some practitioners, with *selected cases* from the practice of others. The average of *really British* cases of Cæsarean section, as given by himself, instead of showing one recovery in four, comes exactly up to my own—namely, one in ten.

perfectly recovered; and in Mr. Knowles' the operation was had recourse to thirty hours after the commencement of labour, and seven only after the rupture of the membranes.

The fact is not to be concealed, that in different parts of Europe, and especially in Roman Catholic countries, both has this operation many times been had recourse to, under circumstances in which no British practitioner would have considered himself warranted in proposing it — where, indeed, there has existed sufficient available space in the pelvis to admit of the extraction of the fœtus *per vias naturales*;*—and also that the women, more under the influence of their clerical pastors than ours are, have readily and cheerfully submitted, from a sense of religious duty, to this dreadful expedient, while they still possessed considerable strength, that they might not deprive their unborn children of the benefit of admission within the pale of the Christian church.

When this means is considered unequivocally requisite, then, by having recourse to it early in the labour, the best chance is afforded to the patient for the preservation of her own life, as also of her infant's. Notwithstanding this, however, no rightly-judging man would venture, on his own single responsibility, to urge the propriety of an operation so unusual in its necessity, so appalling in its character, and so terrible in its consequences, as the extracting a fœtus *ex utero* by an extensive abdominal incision; but before proceeding to its execution, he would naturally be desirous to obtain the counsel and sanction of some neighbouring practitioners, in whose opinion he confided.

One chief cause of the great fatality of the Cæsarean section is the peculiar state which the uterus takes on itself speedily after delivery. A process of disintegration occurs, which must be very unfavourable to the establishment of healthy action. The quantity of blood previously determined to it is immediately very much diminished; the muscular fibres rapidly undergo the fatty degeneration and are absorbed; and the organ itself is reduced, in the course of five or six weeks, from a weight of twenty-two or twenty-four ounces to that of an ounce and a half; a state of things which must militate exceedingly against the union of the divided edges, and its restoration to a whole condition. While this destruction is going forward, new matter is certainly being deposited, as I have before said;* but this is of a very lowly organised character; and the change which is being effected possesses but little power for the reparation of the injury that has been inflicted.†

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* It would, perhaps, be unfair to adduce, in confirmation, those cases in the latter half of the sixteenth century—the second, third, fifth, and sixth of Rousset, which came under his own observation, and the ninth of Caspar Bauhine (Latin Translation of Rousset on the Cæsarean Section), all which women brought forth live children *per vaginam* subsequently, even if they are correctly reported; because they belong to the age of barbarous surgery. But in the report of the Obstetric Clinique, at Pavia, for 1827-28, will be found a fatal case of Cæsarean operation by Professor Lovati, the dimensions of the patient's pelvis being two inches and a half in the sacro-pubic diameter, three and a half in the oblique, two in the pubi-coccygean, and two and a half between the ischiatic protuberances,—a space that would, without doubt, have admitted of the extraction of the fœtus, after the evacuation of the brain; and where consequently, in Britain, the Cæsarean operation would never have been thought of. (See Lancet, August 15th, 1829.) Again, in the Medicin. Zeitung, January, 1840, is detailed another fatal case, in which the operation under a twin pregnancy was performed by Dr. Busch, of Berlin; here the pelvis measured two inches and a quarter in its conjugate diameter. (Medical Gazette, March 13, 1840.) Very many instances of a similar kind might be quoted. I would refer also to Baudelocque, vol. iii. p. 26 (Heath's translation, note), for two instances of Cæsarean section, to prove how little the principles of obstetric medicine were understood by the generality of French surgeons towards the close of the last century.

Such cases of extreme distortion are fortunately of rare occurrence. Not so, however, the lesser degrees of diminution in the pelvic apertures: these we meet with continually; though certainly not so often in the open country, among the hardy agricultural peasantry, as among the inhabitants of great and crowded cities, and the population of manufacturing districts.

If, then, a case come under our notice in which there is more available space than that I have just noted as imperatively requiring the excision of the child from the uterus through the abdominal parietes; and yet where the pelvis is so small that we are persuaded the child's head cannot pass entire, provided it has arrived at full intra-uterine maturity;—a case, for instance, in which the conjugate diameter at the brim measures about two inches;—it would still not be right to let the patient struggle very long in labour without means of relief being used: but we should perforate the head while the system yet retained its vigour, that we might have the advantage of full unimpaired uterine energy to aid us in our extractive efforts. I trust it may not be for a moment imagined that I recommend perforation should be had recourse to early in labour in all cases where we are likely to find it necessary afterwards. It is only in those instances where a *moral certainty* exists that the child cannot pass unmutilated, that we are at all authorised to adopt this extreme measure, before urgent symptoms of danger to the mother's life have supervened, unless indeed there be the most unequivocal proofs of the child's death.

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* P. 119.

† "If then so many dangers beset this operation—if the recoveries from it be so few, and the mortality so great, while the causes of that mortality are for the most part beyond the power either of surgical dexterity or medical skill to obviate, and some of them inseparable from those processes which needs must follow delivery—we may, I think, feel satisfied that the general rule in British midwifery, which prohibits the performance of the Cæsarean section, except where delivery would otherwise be altogether impossible, rests on a far sounder foundation than that of mere prejudice, or blind obedience to the dicta of men eminent in their profession." (West, Case of Cæsarean Section, 1851, p. 23, reprinted from Med. Chirurg. Trans., vol. xxxiv.)

Fortunately it is not necessary to draw a minutely nice distinction between those cases in which it is desirable that craniotomy should be performed comparatively early, and those absolutely requiring the same operation later in the labour; because, inasmuch as the means used are similar under both circumstances, it will seldom prove of material importance—provided the child *must* be sacrificed—whether the dreadful expedient be undertaken an hour sooner or an hour later. But the case is widely different when it becomes our painful duty to discriminate between a pelvis through which a head can be extracted after the brain has been evacuated, and one that will not allow the passage of the child, when lessened even to the utmost degree that art can accomplish. For it would be to the last degree heart-rending and painful—after having perforated the skull and made forcible attempts to extract *per vias naturales* — to discover that the pelvis did not afford sufficient room for the completion of delivery; but that the case required to be terminated by the abdominal incision. Not only, indeed, must the infant then necessarily be brought into the world dead, but the patient would be subjected to much additional and unprofitable agony during our efforts at extraction through the pelvis. A diminished chance of ultimate recovery would also be offered to her, in consequence of the pain and exertion attendant on our frustrated endeavours, and the pressure and perhaps contusion, to which the soft parts must have been more or less exposed.

I have already laid it down as a general principle, that unless there be a clear available space of three inches in the conjugate by four in the lateral diameter at the brim, we are not to expect that the child will be born without assistance; but it is not merely because the pelvis is deformed to such an extent that we are authorised to interfere while the powers are vigorous; because the child may be immature; its head may be small; the bones may be less ossified, and may overlap each other more than is usual; and a greater probability may therefore be afforded of a natural termination of the case. Under such circumstances, it becomes our bounden duty to wait till the exertion sustained has produced no small degree of exhaustion, before we have recourse to such a horrible alternative as the instruments for craniotomy supply. On the contrary, however, if the space exceed two inches but in a trifling degree, it is very evident that a child, sufficiently perfected in the womb to sustain independent existence, cannot be expelled whole; and we are therefore fully justified, under this particular degree of disproportion, in interfering early—however revolting to our feelings it may be—lest our patient should sink under the effects of long-continued and painful toil; lest she should sustain a rupture of the uterus, or suffer such an extensive destruction of the soft parts from pressure, as must render her a burthen to herself and an object of compassion to her friends for the remainder of her life.

In the *second variety*, where the head has entirely passed the pelvic brim—has become jammed in the cavity, and, for want of sufficient space in the outlet, cannot make its exit—the woman generally suffers extreme pain, not only from uterine contraction, but from uninterrupted pressure on the structures within the pelvis. We must bear in mind that the pelvic viscera are exceedingly nervous, very liberally supplied with blood-vessels, and are peculiarly exposed to those unhealthy actions inseparable from a high state of vascularity; that, although they possess great restorative power within themselves, inflammation induced by contusion, the result of pressure, is very likely to terminate in suppuration, and particularly in gangrene. When a disposition to sloughing once commences, it is impossible to say where the destructive process may stop: beginning in the lining membrane of the vagina, all the vaginal coats may take upon themselves the same morbid condition; the bladder and rectum may be implicated, and the three cavities may be thrown into one,—than which it is impossible to conceive a more miserable state of human existence.

Whenever the head is locked in the cavity of the pelvis, we must eminently fear contusion, inflammation, suppuration, and sloughing. We have, also, to dread extensive injury to the bladder:—that organ may burst, or fatal inflammation may occur, consequent upon its over-distension. There is, likewise, great danger to the child, from the compression which the brain must suffer, under impaction; as well as from the pressure to which the funis umbilicalis and the fœtal vessels ramifying on the placenta must be exposed, from the long continuance of uterine action.

This case, then, is one of a very dangerous and difficult character; and it becomes a most delicate question, how long we shall allow nature to struggle unaided;—and whether, at any particular period of time, we shall have recourse to instrumental means. Many rules have been laid down for our guidance under this emergency, for the consideration of which an opportunity will be afforded in a subsequent part of this work.

I have considered *that* as the *third variety*, where the head is partly protruded through the brim, the vertex dipping into the cavity, while the principal bulk remains above. A case in which the pelvis measures about three inches in its conjugate diameter, is of this description. But it cannot be impressed too forcibly or too frequently on the mind of the student, that although we know the size of the pelvis accurately, and have ascertained beyond a doubt that its measurement is even rather below three inches than above it, we are not, on that account alone, warranted in taking an instrument in hand: for it must have frequently happened to every practical man to observe the head wonderfully adapt itself to the irregularities of the pelvis; so that eventually it makes its exit, under circumstances which a few hours before allowed of no expectation, and but little hope, that a natural and unaided termination would occur. We must not, therefore, apply instruments merely because there is a small pelvis, provided it be moderately capacious; but we must give a full and fair trial to the powers of the uterus; and watching attentively both the progress of the head, and the effects of the continued efforts on the mother's system, hold ourselves in readiness to terminate the labour on the first accession of such symptoms as may bring her life into present jeopardy.

Soon after Ambrose Parè had demonstrated the great advantages that extracting the child by the feet, in cases of transverse presentation, possessed over the practice in vogue before his time, the attention of surgeons was particularly directed to the improvement of that operation; many became very expert in its performance; its sphere was considerably extended, and it came by degrees to be adopted as a common custom in cases of labour rendered lingering by inefficient uterine action, and by mechanical disproportion, as well as in those where hæmorrhage or convulsions indicated the propriety of delivery. Thus there can be no doubt that, before the invention of the forceps, this mode of terminating the labour when the head presented, was occasionally the means of averting much danger and suffering from the woman, and of saving the lives of many children that must otherwise have been destroyed in their birth. And although there is good reason to fear that, for want of correct principles of guidance, turning the child was often had recourse to under a head presentation, where that operation was neither suitable nor necessary; yet, upon the whole, we cannot but acknowledge, that the obstetric surgery of the age was benefited by its introduction and adoption

When the forceps, however, became known throughout Europe, and the value of the instrument so universally acknowledged, this mode of terminating lingering labours fell into disuse, especially in England. Nevertheless some of the authorities in France continued to recommend it to a much later date, either in exceptional cases,* or as a substitute for the forceps in general.† In the latter point of view I can scarcely find language sufficiently strong, in which to deprecate this mode of proceeding; and I should not have thought it necessary to discuss the question of *turning*, under a natural presentation more at length here,—since I had believed that such a means of concluding any case of *lingering labour*, where the vertex offered itself, was now almost exploded in this country,—were it not for the advocacy it has received from Professor Simpson, in a memoir which he published as a series of papers, in the Provincial Medical and Surgical Journal. He has counselled its adoption in cases of slightly deformed pelvis, not as the exception, but as the general rule.* *His* arguments indeed, are somewhat different from those of the French authors noted; for they are directed towards its being established in lieu of craniotomy, and he believes it to present the following advantages over that operation, wherever the diminution in space is not very great, as well as over delivery by the long forceps also. "It gives," he says, "the child a chance of life; it is more safe to the mother, because it can be performed earlier in labour, and more speedily;—it enables us to adjust and extract the head through the imperfect pelvic brim in the most advantageous form and direction; and lastly, it is a practice that can be followed, when proper obstetric instruments are not at hand; and the avoidance of instruments is generally advisable when it is possible." † Were these positions correct, there could be no question as to the superiority of this method of delivery; and if it could be always resorted to, as a safe substitute for the horrible operation of craniotomy, it would meet with my warmest support. But I fear such will be found far from the truth; and the dangers it must bring, both to the mother and her infant, appear to me so imminent, that I can but regard it, at best, as an exceptional mode of treatment, suitable to a very limited class of cases.

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* Vide Baudelocque, par. 1290, *et seq.*

† Mad. Lachapelle, Pratique des Accouch., tom. iii. p. 429. Paris, 1835.

As far as the child's preservation is concerned, it is undoubtedly true, that no means could possibly be devised more destructive to it than craniotomy; but I should consider that in those cases where the pelvis is so small as to require the head of the child to be opened,—the vertex presenting,—the chance of saving its life by *turning* would be very inadequate to the risk inseparably connected with that operation; and that where the long forceps could be resorted to, it would be better to wait until they could be applied than subject the patient to such dangers. Besides this, we can in no case, when the capacity of the pelvis is not greatly diminished, predict with anything like certainty that the child will not pass naturally; and the advocacy of this practice might therefore lead, on many occasions, to very unnecessary interference on the part of the practitioner.

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* See also Obstetric Memoirs, vol. i. p. 506.

† Prov. Med. and Surg. Journal, Dec. 1847, p. 674, *et seq.*

Dr. Simpson believes with Baudelocque,* that the head may be extracted entire, after the body is born, through a less space than is requisite for its passage under its natural presentation; and that therefore a more favourable opportunity is afforded to the child of being born with life. Dr. Radford,† with other physicians,‡ thinks this is impracticable;—at least without such an amount of traction being applied to the neck as would endanger the tender ligaments connecting the vertebræ; and consequently inflict a fatal injury. My own opinion is, that although it might sometimes be possible to extract the head entire, after the body is in the world, through a smaller pelvis than would admit of its passage under a vertex presentation, provided the neck were sufficiently strong to afford the means of traction; yet, that, in the great majority of cases where craniotomy would be necessary, if the vertex presented, the same operation would be required after the shoulders were extracted; and that, therefore, the advantage to the child must be regarded as very limited.

But there is another circumstance, besides the chance of injury to the neck, which renders the passage of the head through a contracted pelvis, after the body is in the world, peculiarly hazardous to the child,—the pressure to which the funis umbilicalis must inevitably be exposed, during its transit. Whatever theoretical reasoning may be adduced to prove that there invariably exists a space in a deformed pelvis, into which the navalstring may be directed, and in which it may be preserved free from compression, the truth is that we shall find such reasoning fail us in practice;—that the funis must always be subjected to a dangerous degree of pressure, as well during the passage of the shoulders, as of the head;—and that this will be in the same proportion as the capacity of the brim, cavity, or outlet may be diminished. When we reflect, then, on the extension to which the neck must be exposed,—the pressure that the funis must undergo, and the likelihood that the head will require to be lessened by the partial evacuation of the brain, before it emerges, we can but entertain a slight expectation of the child's survival, under the operation of *turning* in a contracted pelvis.

Nor does version in the case now before us offer more advantages to the mother. It is impossible to introduce the hand into the uterus and turn a child, even when the promise appears most favourable, without compromising the woman's security to some extent; and if this operation be undertaken after the membranes have been broken some time, and while the uterine parietes are strongly embracing the fœtal body, the peril to her will be greatly aggravated. This will be regulated principally by the degree of contraction that the uterus has taken on itself, and that will in a great measure depend on the length of time that has elapsed since the liquor amnii was evacuated. The danger to the mother consists in the risk that her soft structures—particularly the uterus,—should be bruised or lacerated by the operator in the introduction of his hand, or by the irregularities of the fœtal body and limbs, as it revolves round its own axis, in the effort that we make at extraction.

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* Par. 1295. transl. † Prov. Med. and Surg. Journal, July, 1847, vol. x. p. 404.

‡ See Burns's Mid. edit. v. p. 429.

Again,—even if it were possible always to adjust the head to the irregularities of the pelvic brim in the most convenient manner, as far as concerns the adapting the long diameter of the head to the longest diameter of the pelvis; still, it is thought by many practical men, against the doctrine which Simpson advocates, that when the base of the cranium is brought foremost, at least as much space is required for the transit of the head, as if the vertex were to pass first.

The last argument made use of by Dr. Simpson,—that version can be resorted to when proper obstetric instruments are not at hand,—can, in my opinion, very rarely influence the conduct of the practitioner; for it is seldom indeed, under lingering labour, that we have not the opportunity of obtaining any instruments that may be requisite. Besides, I should consider that man blameable, who would attempt to turn a child, where there exists a small pelvis, unless he had the obstetric perforator at command; lest it should be found that the head was too large to pass whole, and that the brain must be partially evacuated before the delivery could be perfected. I am fully prepared to admit that the avoidance of instruments is generally desirable, when it is possible; but the remark applies to every kind of operation, whether instrumental or manual; and in obstetric surgery there are some operations performed by the hand, equally dangerous as, or even more so than, ordinary instrumental delivery.

There is only one kind of case in which I would be inclined to sanction *turning*, in consequence of diminished capacity of the pelvic brim:—if the clear, available space in the conjugate diameter were about three inches and a quarter, or from that to three inches and a half;—if the woman's previous children had all been born dead;—if the membranes were still whole,—or, the liquor amnii having been evacuated,—the uterus had not contracted closely around the child's body, the head being perfectly free above the pelvic brim, not having as yet descended at all into the cavity;—and if the attendant were in the habit of performing obstetrical operations, had acquired a certain dexterity in regard to them, and had perfect confidence in himself;—under such circumstances this means of delivery might be put in practice, as an experimental measure, in the hope of saving the child's life:—but even then, not till the patient was informed of the intended operation, its principle explained to her, its objects detailed, and her concurrence and acquiescence fully obtained.

THE THIRD CAUSE of lingering labour is the PRESENCE OF TUMOURS in the cavity of the pelvis. The morbid formations which may impede parturition vary exceedingly in their nature, consistency, and size; sometimes they possess the solidity of bone itself; at others, their contents are of the most fluid character. According to their size and unyielding nature, will be the difficulty which they occasion.*

EXOSTOSIS.—The most solid of all the tumours that we meet with in the pelvis, is a knobby, bony growth, taking its origin from some portion of the parietes themselves,—an exostosis. But it is fortunately of very rare occurrence; indeed, so infrequent, that I have myself never met with an instance. It is generally situated at the back part, behind the rectum, and springs from the cavity of the sacrum; or perhaps, even more frequently, from the sacro-iliac symphysis. This kind of tumour we may discriminate by its situation, its extreme hardness, the irregularity of its surface, its immobility, its knotty feel, and insensibility to pressure. In regard to its insensibility to pressure, however, we must bear in mind, that though the bony growth itself may be devoid of feeling, the periosteum covering it may be acutely tender; and this may give a deceptive idea as to its own sensibility.

Treatment.—Our treatment of a case rendered lingering by the presence of a disease of this description, will altogether depend upon the size of the growth itself. If it be very small, it is probable that the head will pass without assistance: but if, on the contrary, it be large, occupying a considerable space—since it would be impossible to remove it by operation, so as to render the cavity more capacious—we must be guided by the common rule (provided there be the most distant probability of the child's passing), that of waiting until symptoms appear which demand delivery; and according to the magnitude of the tumour we must select our means. The forceps, long or short, if they offer a fair chance of success, should be preferred; if neither of those instruments avail us anything, we must call in the aid of the death-inflicting perforator. It is certainly possible that an exostosis may have attained such a size as not to leave an inch and a quarter of space between the anterior and posterior parietes of the pelvis. In such a formidable case,—as we could by no means extract the fœtus through the vagina, even although we might succeed in diminishing its volume to the smallest practicable size,

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* I would beg to refer my reader to a paper on pelvic tumours, by Dr. Lever, in Guy's Hospital Reports, April, 1842.

—we should be compelled to have recourse to the Cæsarean section.

Skirrhous or dropsical ovary.—The ovary is liable to diseases of various kinds, of which dropsy and skirrhus are the most frequent. Under both these affections, the gland becomes very considerably enlarged; and when it is the subject of dropsy, its coats are extended to an enormous size, containing in some instances many quarts of fluid. We cannot be surprised, then, at the impediment offered to the child's birth, if pregnancy and an ovarian tumour exist together. When enlarged by disease, the ovary generally rises *gradatim* from the pelvic into the abdominal cavity; but occasionally it becomes bound down by adhesive inflammation to the subjacent parts; and if, under such a state, the woman conceives, and carries her fœtus to the full period, her labour must necessarily be difficult. Even if it be not confined to the pelvis by adhesion, it may be found in labour occupying the cavity more or less, never having commenced its ascent into the abdomen; being prevented, perhaps, by the gravid uterus, which has already taken possession of that space. Or a portion of the diseased mass may have prolapsed, and subsided during gestation; for pregnancy by no means interferes with the continued progress of such an enlargement.* Indeed, some practitioners of repute assure us that ovarian tumours increase more rapidly during pregnancy than at any other time. †

The situation of this tumour is also external to the vaginal coats, and it is generally to be felt towards the posterior or lateral part of the pelvis. It will probably be somewhat moveable; it will neither be so hard nor so irregular as an exostosis, and will most likely possess more sensibility.

Treatment.—The treatment under such circumstances must likewise depend upon the size and solidity of the morbid growth. If its true character be detected before the head has become much engaged in the pelvic brim, we may possibly,—provided it be free and not adherent,—succeed by steady pressure in pushing it up above the brim, and consequently out of the way of the head's advance. ‡ If we cannot accomplish this object, we must act upon common principles, and wait until symptoms appear requiring our interference: for if it be soft, the descending head will probably compress it into a flattened form, or squeeze a part of its contents upwards above the brim, and thus diminish its resisting power: while, on the contrary, if the disease be of a more solid kind, it would be wrong to have recourse either to obstetrical or surgical instruments, until necessity compelled us. When this necessity appears, it will be for us to determine whether we shall puncture or excise the mass, or whether we shall extract the child by instrumental aid. It is impossible to lay down any general rule applicable to every individual case; but we may establish the principle, that if the swelling possess the *least* degree of perceptible fluctuation, or if it be not absolutely bony or cartilaginous, a puncture should be made into its substance by means of a trochar introduced through the vagina or rectum. Provided the tumour projected equally as much anteriorly as towards the rectum, I should prefer puncturing through the vagina, because the blood-vessels at the posterior part of the vagina are less than the hæmorrhoidal vessels; and there would, therefore, be less danger of alarming hæmorrhage following the wound.* Even if

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* Plate 48 displays an enlarged ovarium occupying the pelvic cavity, and impeding the descent of the head. The principal features of this plate are copied from a drawing given by Merriman in his excellent synopsis. A the os pubis, B the enlarged ovarium lying in the cavity of the sacrum, between the rectum C and the posterior wall of the vagina D, consequently *outside* the vaginal canal.

† Ingleby's Obstetric Medicine, p. 119.

‡ Merriman (Med. Chirurg. Transactions, vol. x. p. 61) gives a case in which he pushed a tumour, occupying the pelvis in labour, above the brim without difficulty, and thus procured room for the birth of a living child. A patient of my own has an ovarian tumour which has impeded delivery in two of her labours; on both of which occasions I succeeded, with very little trouble, in raising it out of the way of the head's descent.

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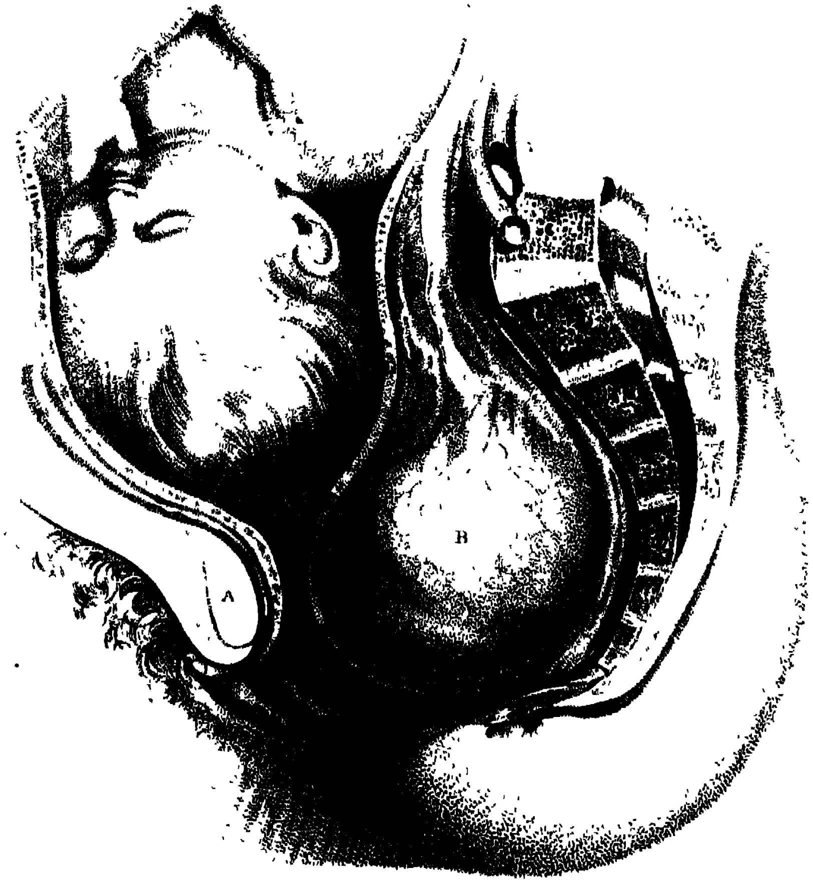
* "Notwithstanding the many testimonies which may be adduced in its favour, the practice of puncturing vaginal tumours is by no means generally acted on even in the present day." (Ingleby, Obstetr. Med. p. 123.) He recommends this operation more generally than has usually been done; and in all cases not absolutely bony, he thinks a grooved needle or small trochar might be introduced as a tentative measure. He gives two very unpromising cases, there being not the least fluctuation to be felt, in which puncturing, *per rectum*, was had recourse to with great success. In a case recorded by Ashwell (Guy's Hospital Reports, No. 2), a tumour which impeded parturition burst into the vagina; and one, where the same took place, and several gallons of serous fluid escaped, is detailed by Mr. Langley in vol. vi. Lond. Med. Surg. Journal, p. 319, Oct. 4th, 1834.

Early in the morning of Sunday, Nov. 21st, 1847, I saw Mrs. H , a patient of the Royal Maternity Charity, in labour of her first child. She had been in occasional pain the whole of the day before. The os uteri was high, very thick, and rigid, not dilated beyond the size of a shilling, the membranes still whole. The pelvic cavity was almost entirely occupied by a tumour, apparently quite solid, larger than the closed fist of a man, which was filling the sacrum, and extending forwards chiefly towards the right side. Labour-pains continued through Sunday and Monday, trifling in character, and infrequent; and on Monday night, at eleven o'clock, the membranes broke spontaneously. From this time the pains became stronger; still the os uteri showed no disposition either to relax or open. Labour continued throughout Tuesday; but the contractions of the uterus were never either active or vigorous. At 7 A.M., on Wednesday, the tumour was punctured through the vagina, by means of an ordinary-sized trochar. At that time there was not the *least* degree of *fluctuation* perceptible; though I fancied I could discern, by hard pressure, a *slight* sensation of indentation, or pitting. A large teacupful of yellowish matter, exactly in consistence and appearance resembling thick custard, flowed through the canula; and probably as much again oozed away after its removal. This became solid when it cooled; and chemical analysis discovered that it chiefly consisted of fat globules. The tumour now almost entirely disappeared, and could scarcely be felt either by the rectum or vagina. At 4 P.M., the pains having been strong since the tumour was punctured, and symptoms having arisen indicative of much constitutional distress,—the os uteri having become hot and tender, though not dilated beyond the size of a crown-piece,


A
B

the disease be simple dropsy, we must not expect to evacuate all the fluid, because the tumour will most likely be formed of separate cysts of different sizes, possessing no communication with each other; but we may let out a part of the contained water; and if, fortunately, the cyst we puncture should be large, we shall reduce the general bulk so much as to afford a fair chance for the head to pass. Should the contents, however, be found of a semi-solid or gelatinous consistence, too thick to run through a trochar, it would then be right to make an incision into the mass from the vagina, of half an inch or an inch in extent, with the hope of entirely evacuating the sac. If, lastly, by these means we effect no material diminution in its size, we must determine whether we should extirpate it through the vagina, or deliver the child either by the forceps or by opening the head. If there be the least chance of delivery being effected by the forceps, that would be preferable to either of the other methods; but if the forceps fail us, we have no choice left, except either dissecting out the tumour or perforating the skull. The removal of the diseased mass would, no doubt, be both very difficult and hazardous, on many accounts; and, horrible as the alternative is, I should, in my own practice, rather destroy the child than subject the mother to such a formidable operation.

SKIRRHOUS GLANDS.—Another species of tumours offering an impediment to the head consists in the glands situated along the hollow of the sacrum having become affected with skirrhous enlargement.

Skirrhous glands may be detected by their situation, irregularity, and hardness—by their being very sensitive—by their forming a chain of indurated tubercles, also external to the vaginal coats—and by their being more or less firmly attached to the surrounding structures. Concerning the treatment of such unusual cases, I have nothing to add to what I have just advanced in regard to enlarged ovaries.

ABSCESSES will occasionally form in the pelvis during pregnancy,

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—there having been also, for some hours, a discharge of fœtid gas from the uterus,—and there remaining not the slightest doubt of the child's death, I perforated the skull, and delivered in about an hour, or a little more. The woman had a slight attack of hysteritis after delivery, which gave way to leeching and purging; and she recovered perfectly; but in a few months a tumour appeared at the right side of the lower abdomen, for which she was received, under my care, into the London Hospital; and which was, no doubt, ovarian. It has remained nearly stationary in size up to this time; but no morbid enlargement can be felt in the pelvis by examining *per vaginam*. She has never been pregnant again.

I detail this case at length, because it shows how desirable it is to puncture every morbid tumour in the pelvis impeding delivery, even although it may give to the finger the sensation of being perfectly solid. Had this tumour not contained semi-fluid matter, no means of delivery could have been resorted to, except either its extirpation, which would have been a fearful and most difficult operation, or the Cæsarean section.

and in this case there would be decided fluctuation present. An abscess might be distinguished from a dropsical ovary by its situation, perhaps—its excessive tenderness on pressure—and its formation having been preceded and accompanied by symptoms of local inflammation, and indications of the suppurative action. An error in diagnosis, however, would be but of little consequence here, since the treatment employed in the two cases must be essentially and positively the same. There could be no hesitation in puncturing such a swelling through the vagina, and letting out the pus. The difficulty would then be over, and the head would most probably pass.

POLYPI.—Tumours, however, formed within the uterus, or growing from the internal surface of the vagina, will sometimes impede the passage of the head. These are of a polypous character; they are fleshy and solid in their structure, and grow occasionally to an amazing size. It is singular that the presence of an excrescence of this kind in the uterus does not prevent conception taking place; which fact I have myself had more than one opportunity of witnessing.*

A case is detailed by my father,† which came under his observation, as well as mine, in 1821, that offers some valuable points of practical instruction. He had been requested to superintend the labour of a woman pregnant of her third or fourth child, but was from home when the messenger arrived to summon him; I consequently went in his stead. I found her suffering severe pains, and using forcible bearing-down efforts, under the belief that the child was about to pass immediately. On making an examination, I instantly detected that the pelvic cavity was occupied almost entirely by a solid fleshy substance, much larger than a goose's egg, which was pressing considerably on the perineum: the os uteri, at the brim of the pelvis, was dilated to about the diameter of a crown piece; and the membranes, unruptured, were being forcibly propelled against the upper part of the tumour with the return of each uterine contraction. I was at no loss to determine that the growth was of a polypous character, by its firm consistence, its shape, its situation *within* the vaginal cavity, and its attachment within the os uteri. The mouth of the womb dilated rapidly, the membranes burst speedily; and in less than an hour after my arrival, the head, under the action of powerful throes, forced the principal bulk of the mass external to the vulva (which still, nevertheless, retained its attachment to the uterus by the stem), and itself instantly followed. At the same

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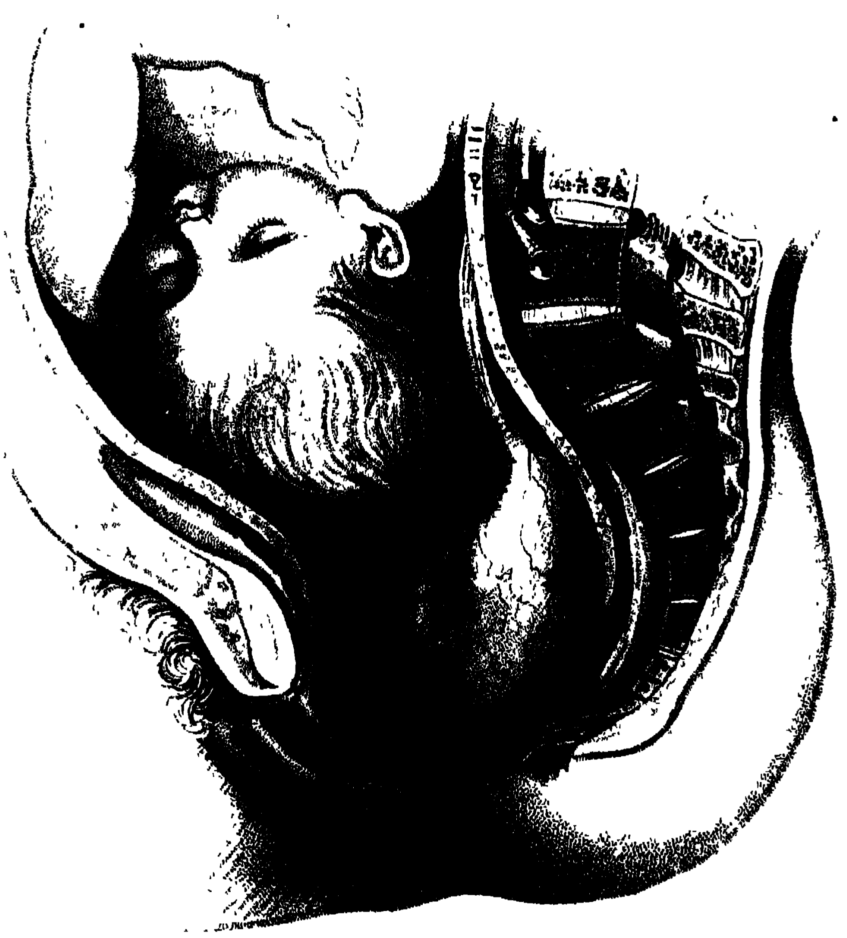
* Plate 49 shows a polypus, A, lying in the vagina, and filling the pelvis to such an extent as to prevent the passage of the head. B the posterior wall of the vagina, behind the tumour, which consequently is situated *within* the vaginal cavity.

† Practical Observations in Midwifery, case 214; or 166 of the Second Edition.



moment my father entered the room, and, with myself, had an opportunity of examining it lying forth between the thighs. Now, however, that the difficulty, as far as regarded the birth of the child, was removed, it became a question in what manner the polypus should be treated;—whether it should be taken away immediately by a knife, after having surrounded the stem by a ligature, so as to secure the vessels; or whether it should be returned into the vagina, and a future opportunity taken of tying it, according to the commonly adopted method. In favour of the first suggestion, it might have been urged, that the tumour was at that time so completely under control, as to render the operation one of the easiest description; and against it, that the difficulty of tying a polypus, lying in the vagina, by means of the double canula, is but trifling; and in the case before us, might easily be accomplished at any time. Besides,—the uterus being so eminently disposed to take upon itself inflammatory action in all cases after delivery,—there was great danger lest the double irritation of the inflicted wound and the attached ligature should excite a disease which it would be difficult to keep in check. Again, it seemed likely that,—as the adventitious growth was nourished by the same vessels which supplied the uterus,—these vessels had become enlarged in proportion somewhat equivalent to the increase in the calibre of the uterine vessels themselves. If such were the case, it was fair to infer that, as the uterine vessels shrunk after delivery, the vascularity of the polypus would also be materially diminished; and that this diminution in the bulk of the morbid growth would render its removal altogether less formidable. These reasons induced us to delay the operation, at least until the changes consequent on delivery were accomplished, and the puerperal state had terminated. The result both justified our expectations, and confirmed the correctness of our reasoning; for my father made several vaginal examinations during the few first weeks after delivery, and satisfied himself that, as the uterus contracted, the tumour also lessened in size. After the lapse of nearly four months—no symptoms appearing in the mean time to call for earlier interference—the polypus was tied in the usual manner, and sloughed off in five days; and at the time of its removal, its size was scarcely so great as a walnut divested of its outer husk.*

Diagnosis.—There can be but little difficulty in detecting a case of this kind. The pear-shaped, solid mass will be felt more or less occupying the cavity of the vagina, attached by its pedicle either to the vaginal membrane itself, or to the uterus; or the stalk will be lost, as it were, in the cavity of the uterus, and the point of its connexion with the healthy structures will not be discernible; we shall be able to pass the finger all around it, to encompass its bulk and determine its shape.

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* See a fatal case of polypus of the vagina, which was tied immediately after labour, by Mr. Fordham, Med. Phys. Journal, 1811, vol. xxvi. p. 38.

Treatment.—Should a tumour of this description have acquired such a magnitude as to offer great resistance to the passage of the child's head, we must to a certain extent follow the common principles already inculcated, and give nature a fair trial, in the hope of witnessing a termination such as I have just detailed. But if the powers begin to fail—if the parts become tumid, hot, or dry, showing a disposition to inflame, then it will be necessary to interfere; and the question will naturally arise, whether we shall remove the polypus, or deliver the patient by instrumental means. If we can deliver easily by the forceps, we had better have recourse to them, because they do no injury either to the child or mother; but if delivery is impracticable through their agency, rather than perforate the skull, a ligature should be put around the stem, and the tumour should be cut off below. On the removal of the morbid mass, the child's head will probably be expelled.

DESCENT OF THE BLADDER.—The bladder sometimes prolapses before the head; of which accident I have seen many instances. Much embarrassment, and no small danger,[*] may be the consequence of the case being overlooked or mistaken. This usually occurs in the early period of labour, before the head has engaged in the pelvic cavity, and depends on pressure exerted by the descending head upon the fundus, or middle portion of the organ, at a time when it is partially distended with urine.[†]

The symptoms attendant on prolapsed bladder are very distressing; there is a painful sensation of fulness, tension, and pressure downwards, in the situation of the pubes; with a feeling of dragging from the navel, or rather the mid-space between the navel and pubic symphysis; constant desire to micturate; an inability to void urine on the exercise of the will; and sometimes an involuntary escape on each return of uterine contraction. On examination *per vaginam*, the finger will detect a soft fluctuating swelling, filling up the anterior part and one or both sides of the

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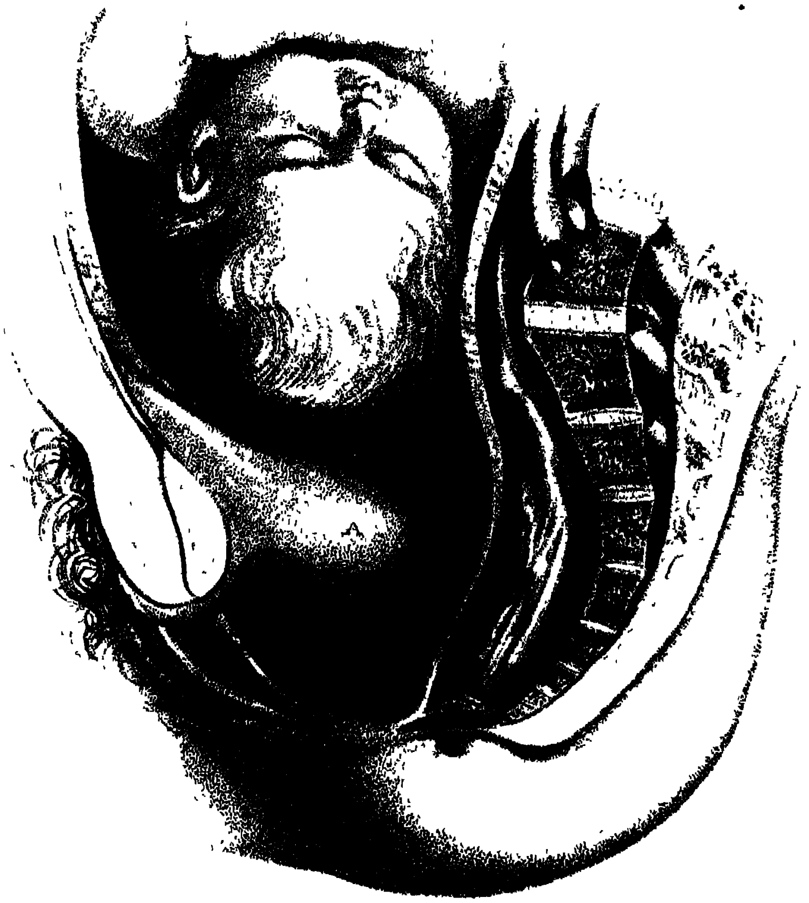
[*] See Merriman's Synopsis, p. 202, for a case where an inconsiderate practitioner thrust a sharp instrument into the bladder, under the belief that the swelling was a dropsical head. Hamilton (MS. Lectures, 1821) used to tell of another equally rash, who, mistaking the prolapsed bladder for the membranes of the ovum, punctured it, with the intention of letting off the liquor amnii. I can readily imagine that the distended organ in this situation might be mistaken for a dropsical ovary, and its contents discharged by puncture or incision, if the precaution of introducing the catheter were not used.

[†] Plate 50 shows the bladder, A, thus prolapsed, a part of it being retained in its ordinary position by its attachment to the abdominal parietes. See an able paper on this subject by Mr. Christian, of Liverpool, Edinburgh Med. Surg. Journal, vol. ix. p. 281; also, Davis, Obstet. Med., vol. ii. p. 986.


A

pelvic cavity, below the fœtal head; and the patient will complain if steady pressure be made on it. The introduction of the catheter, which may be easily accomplished, will at the same time withdraw the fluid, cause the swelling to disappear, and relieve the characteristic suffering. Keeping in mind the possibility of the bladder being pressed downwards as described, it is an essential duty never to puncture any fluctuating tumour within the pelvis, until we are first assured that it is not vesical, by the removal of the urine by means of the catheter. A chronic prolapsus of the bladder is likely to follow its accidental descent in labour.

SKYBALA.—There is still another adventitious pelvic protuberance which may impede the passage of the child; a collection of fæces in the rectum. It is not usual to meet with a case of this kind in the higher classes of society; but it is by no means uncommon among the lower orders; and I have seen more than one instance, in which the mass contained within the rectum was so hard and so large, as for some time to obstruct the exit of the head.*

It is not likely that we shall confound this cause of protraction with any morbid pelvic growth; because by passing the finger into the vagina, and tracing the rectum, that gut will be felt bulging forward; but if any doubt remain, an examination *per anum* will necessarily dissipate it.

Treatment.—The obvious indication here is, to evacuate the bowel of its contents. This may be done by throwing up twelve or fourteen ounces of warm water, so as to liquefy the fæces and dislodge them. But cases have occurred in which all attempts to inject a fluid were rendered nugatory, in consequence of the hardness and compactness of the mass. It has been advised that we should, in such an aggravated state, endeavour to empty the rectum by means of the handle of a spoon. It need scarcely be remarked, that this cause of difficulty may be entirely obviated by proper attention being paid to the due evacuation of the canal during the last five or six weeks of utero-gestation.

A FOURTH CAUSE of lingering labour consists in RIGIDITY of the soft parts through which the child must pass: and this is a subject of great interest, because of its frequent occurrence, the excessive pain generally attendant upon the case, and the difficulty that is often experienced in overcoming the resistance occasioned.

It has been already shown, that rigidity may exist in the os uteri, the vagina, or the perineum, separately: but we usually observe that when one part is affected, all the structures partake more or less of the unhealthy condition; so that, even after the os uteri is fully distended, much delay and distress is experienced in the dilatation of the vagina and external parts.

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* See a case in point in my father's Practical Observations, Part I. p. 231, First Edition; p. 132 of the Second, note.

Women who are bearing their first child,—especially if they have entered the middle period of life,—those who possess a strong constitution, engrafted on a vigorous and rigid fibre, are the most likely to suffer from this cause of protraction. To add to the distress, it is very usual, when extraordinary rigidity exists, for the membranes to break early in the labour; and this unfortunate occurrence much aggravates both the pain endured, and the tediousness of the dilating process.

Cases rendered lingering by preternatural rigidity are exceedingly perplexing, and often very unmanageable: they are frequently followed by inflammation of the uterus or vagina, by abscess, and sloughing. As each of these states deserves a distinct consideration, I shall first call the reader's attention to

Rigidity of the os uteri.—When a woman has borne a number of children, the uterine mouth generally dilates very readily, and therefore we may expect to meet with this cause of difficulty more frequently in primary labours; but this is by no means universally the case. A very uncommon exception to this general rule came under my observation on one occasion many years ago. I attended an unmarried woman, pregnant with her first child, who was in as comfortable a condition as her situation would admit of. When labour set in, the os uteri opened with no difficulty, and the child was born in four or five hours from the time I was summoned. She again became pregnant, but it was under very different circumstances; and her mind was much more disturbed than on the first occasion. On the accession of labour the membranes broke early; the pains soon became exceedingly violent; the head was urged powerfully against the undilated and rigid os uteri; irregular muscular spasms supervened; and at the end of about fifty hours from the rupture of the membranes, —when the dilatation acquired did not exceed the diameter of a shilling, while I was instituting an examination, in the acmé of a strong pain, with the greatest possible care,—I felt the os uteri split on the right side, and I traced the rent considerably upwards through the cervix. At the same moment, the head passed into the vagina, and was expelled by a continuance of the same contraction. During the progress of this labour, I bled the patient to syncope three different times, and exhibited opium freely, my mind being impressed with a dread of the very accident which occurred. It is an instructive case, because it proves, that although an os uteri has relaxed and dilated readily in a first labour, it may on after occasions possess a high degree of unnatural rigidity,—and that, too, independently of the existence of any discoverable disease in the organ itself. It proves, also, that the much-vaunted power both of bleeding and opium will not always avail in removing rigidity. The poor creature died on the fourth day after delivery, from uterine inflammation. This is a case in which the inhalation of an anæsthetic vapour, had their use then been known, might have been productive of much benefit. But it was impossible to surmise that the os uteri would lacerate in this manner; especially as, though rigid, its structure appeared healthy, and as it had dilated so kindly in her former labour.

More recently I was requested to take charge of a lady, the mother of nine children, who was suffering much from anasarca, with the abdomen immensely distended, partly from the enormous size which the uterus had acquired, and partly from fluid in the peritoneal cavity. The os uteri, from the beginning of labour, bore a thick, soft, puffy, œdematous character; its dilatation proceeded slowly and painfully; the membranes broke at one in the morning, when it was dilated to the size of a crown. At four its diameter was very little more; and while I was in the act of examining, during a strong pain, as in the last-mentioned case, I felt it tear at the back part, in a direction upwards. The finger, on being withdrawn, was tinged with blood. The child was born at five; its weight was twelve pounds and three quarters. The shoulders were so broad as to give me much trouble in their extraction. During the interval between the birth of the head and passage of the shoulders, the child gasped once; but died immediately on its expulsion. The uterus contracted, and expelled the placenta; there was some after-hæmorrhage, though not to an alarming extent. The patient suffered neither pain nor any kind of distress till the expiration of thirty hours, when she was seized with a violent rigor, followed by copious perspiration. The pulse rapidly rose to one hundred and fifty beats in a minute; the skin became hot; great loss of power supervened; the tongue and hands were very tremulous; the nights were passed without sleep; the breathing was quick, but not painful; no milk was secreted; yet the lochia flowed naturally; the stomach never rejected its contents; the urine and fæces passed without pain; and there was but little uterine tenderness: but the countenance gradually became more depressed and anxious; and on the fifth morning after her delivery, she was suddenly seized with great difficulty of breathing, and died in an hour from the accession of this symptom.

Rigidity of the os uteri is known by that organ being hard, firm, though probably not morbidly tender,—by its resisting the dilating powers of the membranes, or fœtal head—and by our not being able to make any impression on its edge by the finger. It is not likely that we should mistake a case of rigidity of the os uteri for one in a more natural state. It must be recollected, however, that rigidity of the soft parts may co-exist with a deformity of the pelvis; and that each of these causes may, at one and the same time, be operating to retard the progress of the labour.

Treatment.—Under this rigid condition of the os uteri, it is our duty, if possible, to produce a relaxation in the part; and we are possessed of some means which have been esteemed highly efficacious for that end. Observing how supple and distensible the organ becomes, and how readily disposed to dilate it usually appears under hæmorrhage,—bleeding has very generally been adopted to effect this object. This is certainly a powerful, but by no means always a safe agent; and unless used with much judgment, is likely to be productive of serious evil. The great objection that attaches to bleeding at the commencement of labour, is, that there must necessarily be a certain quantity of blood lost after the child is born. We are in perfect ignorance how much that may amount to; and it would be wanton to take blood from the arm without grave occasion, when the few ounces we may voluntarily abstract,—had they been preserved in the woman's system,—might have turned the vacillating beam of life in her favour, and snatched her from impending death. This, however, is but a remote, though probable danger; and it becomes a question, whether we ought to take into account a remote probability, when weighed against a state of actual and existing difficulty. My father* always used the lancet with caution under the first stage of labour, in consequence of the risk of flooding afterwards; and I, in conformity with his views, adopting his sentiments, and relying greatly on his practical experience, have seldom directed bleeding in the first stage of labour, for the purpose, simply, of overcoming rigidity. There were for many years, on an average, above two thousand women, in one Charity, annually delivered under my immediate superintendence; these patients' labours were not of more than an ordinary length, and there were actually fewer deaths among them than we meet with in the higher circles, relatively to the amount of cases. Of this number I scarcely bled one under labour, unless the os uteri was so painful as to indicate an inflammatory condition, or there were evidences of undue determination of blood to the brain, or symptoms of congestion or inflammation of some other viscus. At the same time, it is but fair to state that my father, although he was adverse to indiscriminate bleeding in all cases of rigidity of the os uteri, considered it sometimes useful to soften and relax that organ; that Merriman[*] speaks with praise of this means as occasionally useful; that Dewees[†] thought it certain and never-failing in its effects; Blundell,[‡] Burns,[§] and other eminent practitioners recommend it; and Hamilton[‖] used to assure his class that he could always relax the os uteri by bleeding, and that he never allowed the first stage of labour to continue longer than twelve or fourteen hours, so completely had he the process under his control; he stated also that he never had had a patient in labour more than twenty-four hours, except where disproportion existed, since he began this practice. There is certainly no doubt that the robust constitutions of the northern females bear depletion better than the comparatively weak systems of this metropolis. This observation also holds good in regard to the country: and those who are engaged amongst a race of peasants may, no doubt, have recourse to bleeding more frequently with advantage, than others can dare to do who are located among a population enervated by luxury, or debilitated by the want of wholesome air, food, and exercise.

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* See Practical Observations in Midwifery, part I. p. 231; p. 132 of the Second Ed.

With regard to bleeding, then, as a means of relaxing the os uteri, I look upon it as powerful, but not devoid of danger. To do good, it must be carried far enough to make an impression on the general system; for it is idle to expect advantage will be derived from it, unless syncope, or at any rate a degree of faintness, be produced. But there are some constitutions which bear the loss of blood so ill, as to preclude the use of the lancet altogether; and yet in such we may possibly meet with preternatural rigidity. Even the warmest advocates[¶] for the depleting system acknowledge this to be the case; and other measures have consequently been had recourse to with the same view.

As second in importance rank opiate enemata. Opium, whether exhibited by the mouth, or by injection,—provided it be used in sufficient quantity, will suspend uterine action, as well as relieve muscular spasm. If the contractions then are not powerful, it would be wrong to administer it. Opium is found of incalculable benefit in removing false pains, and is eminently useful in those cases where the membranes have ruptured early—where the uterus is acting strongly and powerfully—where it is urging the head of the child against its undilated mouth; causing excessive agony; inducing irritability, fever, and nervous excitement; and producing no effect equivalent to the suffering endured. In such a case, if sleep can be obtained, an opportunity of recovery is afforded to the system; and the woman gains strength to enable her to bear up against the fatigue necessarily attendant on such great exertion; besides which, during the time of inaction a favourable change may have taken place in the os uteri, predisposing it to dilate more kindly when the pains return. On both these accounts, then, opiate injections are useful when the pains are violent and irritating, and not producing advantage equivalent to the suffering. they bring with them;—they procure rest and ease for a certain period; and, in the interval of action, they afford an opportunity to the os uteri to take on itself a more kind and favourable state. I am perfectly satisfied that opium possesses no positive power to relax a rigid os uteri,* and that its virtues are entirely centred in its capability of moderating excessive action. The danger of opiates exhibited under labour is, that the uterine contractions may be so entirely removed through their agency, as never again to be established; and thus the case may be converted into one requiring the use of instruments—perhaps even of a destructive kind.

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[*] Synopsis, p. 29. [†] Essay on Facilitating Cases of Difficult Parturition, p. 98.

[‡] Obstetricy, by Castle, p. 601.

[§] Principles of Midwifery. Fifth Edition, p. 411.

[‖] MS. Lectures, 1821. See also Practical Observations, p. 137, where bleeding is recommended; and p. 120, where the necessity of securing the termination of the first stage within the specified time is insisted on.

[¶] Hamilton's Observations, p. 137.

An infusion of tobacco, in enema, has also been suggested in rigidity; and Dewees † has related a case in which two clysters were injected, with the view of relaxing a vaginal cicatrix, an interval of an hour and a half intervening between their administration; but the alarming symptoms which supervened, proved the danger attendant on their use. This herb is very efficacious in reducing irregular spasm, and relaxing muscular fibre; but independently of its dangerous character, it is of no avail in rendering the os uteri more supple: nor, indeed, should we, *à priori*, expect such an effect from its application; for the difficulty experienced does not arise from accidental spasm, or irregular fibrous contraction; but depends upon an originally firm, hard, rigid, and unyielding texture.

Common domestic clysters are most useful and valuable assistants under all cases of rigidity, both of the os uteri and vagina. They are serviceable by clearing the bowels, by acting as an internal fomentation, and also by amusing the patient's mind. By having recourse to such harmless means, we give her reason to think that she is not neglected, but that all is being done for her relief which art can accomplish: and thus both hope and confidence are inspired, and time is also gained for a full and fair trial of nature's powers; which negative virtue, indeed, is of equal, or perhaps greater advantage, than any of the more positively useful attributes of these applications.

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* Dewees, in his Essay on Facilitating certain Cases of Difficult Parturition, p. 84, advances the same opinion regarding the inefficacy of opium as a *relaxing* agent.

† System of Midwifery, p. 379.

Substances have been applied to the mouth of the womb itself, with a view to relax it: and belladonna has been recommended for this purpose; in London, by Conquest;[*] and in France, by Chaussier, Velpeau, and La Chapelle; but this practice has not met with the general sanction of the profession in this country. It is recommended that one or two drachms of the extract undiluted be rubbed on the os uteri; or it may be mixed with lard in various proportions.

The knowledge of the extraordinary powers which this drug possesses in relieving pain by paralysing nervous excitability, and overcoming tonic spasm, led to its employment in this species of agonising labour; but it seems to have no effect in producing relaxation of the os uteri; and if no good result from its use, it must be injurious;—not in consequence of the poisonous quality resident in the drug itself, but from the friction which is necessary for its efficient application. The mucus that naturally lubricates the part must be wiped away, and this irritation must predispose the tender organ to take upon itself inflammatory action.

It is the custom, also, in France, to inject mucilaginous fluids, as recommended by Gardien,[†] and warm oil, into the vagina, for the purpose of softening the os uteri, and giving an extra degree of lubrication. I do not see the slightest objection to this practice, and in some instances it may be desirable and beneficial. Two or three syringes full might be thrown up once in every hour.

The warm bath has been suggested, and a trial made of its effect, by Dewees;[‡] but it is inconvenient in its use; it is not generally at hand; it tends to weaken the system, and is of no service in relaxing the part: it cannot, however, do much injury, unless indeed it produce hæmorrhage, as it seemed to have done in one of the cases cited by Dewees; and perhaps, in some very rare instances, it might be of benefit, especially if there were preternatural heat and dryness of the skin. External warmth applied to the vulva, as in cases of rigidity of the vagina and perineum, will occasionally be desirable; but its relaxing effect on the os uteri is very questionable.

Under a state of preternatural rigidity of the os uteri, it not unfrequently happens that, without any apparent cause, and independently of any means being used, sudden relaxation takes place; and from that time the labour progresses with much greater rapidity. This favourable alteration in the condition of the organ is generally accompanied by sickness: and I always hail an attack of vomiting under such circumstances, provided there be no symptoms of exhaustion present, as the harbinger of a fortunate change. I have stated above,* that emetics have been recommended for the purpose of facilitating the dilatation of the uterine mouth, under the erroneous idea that the vomiting was the cause of the softening observed; but that artificial vomiting, induced with this view, had disappointed the expectations of its advocates.† Antimony, nevertheless, in doses sufficient to keep up a feeling of nausea, has been exhibited in these cases with marked advantage.

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[*] Outlines of Mid. 6th ed. p. 82.

[†] Traité d'Accouch. vol. ii. p. 271, 1807.

[‡] Essay on Difficult Parturition, p. 87.

In few cases of labour does the patient suffer more, than in those that are rendered lingering by rigidity of the soft structures; partly therefore because of the disproportionate severity of the pains; and partly also because it is alleged that anæsthetic vapours possess the power of causing the os uteri to relax and open, chloroform may here be administered, provided due caution is exercised, and its effects are watched with the requisite attention.

Under rigidity of the os uteri, the forceps can never be available. Unless this organ, indeed, is entirely, or almost entirely dilated, neither the long nor the short forceps can be used. I am not prepared to assert, that in some rare instances of rigidity the head may not require to be opened.‡ It is seldom, however, that such an extreme case exists; for in time the organ usually gives way. When this condition of the os uteri is the sole cause of delay, we should wait until the last moment, consistent with the probability of the woman's ultimate recovery, before we resort to craniotomy, unless there are unequivocal symptoms of the child's death.

Generally, in cases where the os uteri is rigid, it is found high, at the brim of the pelvis, or in its natural situation; but at other times the head of the child has descended into the pelvic cavity, covered by the thin expanded cervix; and the mouth of the womb is comparatively low, looking back towards the coccyx or sacrum. Such a case may be the occasion of much error and disappointment, unless it be clearly detected; for, on passing the finger for the purpose of making an examination, the tumour caused by the head will be distinctly felt occupying the pelvic cavity; and if the examination be carelessly conducted, or the possibility of the occurrence did not offer itself to our mind, we might suppose that the child would be born immediately. If we form an opinion to that effect, however, in such a case, we shall be greatly deceived; for many hours of wearying pain must be experienced before the os uteri will dilate in a sufficient degree to allow the transit of the head. The sensation communicated to the finger by the tumour itself will sufficiently indicate the nature of the case. Instead of feeling the denuded, hairy scalp, we detect a smooth, polished surface; sensible—perhaps acutely so—to the touch; neither suture nor fontanelle will be distinguishable; and, on carrying the finger back towards the sacrum or coccyx, we shall find the os uteri opened not more than to the size of a sixpence or shilling; and through its orifice the head will be clearly perceptible. From the sensibility of the structures, then, against which the finger is pressed, the smoothness of its surface, the indistinctness of the sutures or fontanelles, the absence of hair, and the aperture distinguishable at the posterior part of the tumour that fills the pelvis, we may know that the head has not cleared the uterus, but that it has come down covered by the thinned neck.*

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* See p. 93.

† Riverius, two centuries ago, remarked on the practice of giving emetics to facilitate uterine dilatation; and Lowder said, "he had often known spontaneous vomiting do good, but had seldom found benefit from the exhibition of emetics, though he had frequently seen them used." The most disgusting substances in nature have been advised, at different times, to excite parturition. Thus Hartman (Opera, folio, p. 72) tells us "Apud pauperes vidi sæpè partum difficilem solvi haustu urinæ mariti. Sic stercus equinum in vino expressum et percolatum, subitò fœtum et secundas expellit." A midwife, also, named Sarah Stone, who published some cases in 1737, gives several instances in which women in labour were made to drink their husbands' urine. Merriman—Synopsis, p. 30—who quotes these passages, remarks, "If such horrible messes were ever serviceable, it was probably by inducing nausea and vomiting." Perhaps the effect on the mind, arising from the confidence with which they were advised, might also have had some influence.

‡ See case in the note at page 226 of this work.

Where the os uteri still continues undilated, and indisposed to dilate or relax, many hours after the membranes have broken, the head being urged with dangerous impetuosity against it, upon each return of uterine contraction; where bleeding, tartar emetic, and opiates, with other means, have failed to produce the effect desired from them,—lest the os and cervix uteri should be torn from the body of the organ,† it has been recommended to make one or more incisions into it at its edge, as suggested by Burns.* That some rare cases of labour may occur, in which incising the mouth of the womb may be necessary, is quite possible; but I would caution my younger readers against regarding this practice as one of the *ordinary* operations of obstetric surgery; because the os uteri possesses wonderful powers of dilatation, even in cases that might appear almost hopeless; and because of the probability that the incision may be continued, as a rent, into the body of the uterus itself, implicating the peritoneum in a frightful and perhaps fatal injury. I cannot coincide in the opinion expressed by Dr. Lever, that "such an incision is unattended with danger,"† even though it be "unaccompanied by pain, and free from copious or dangerous hæmorrhage." For myself, I should hesitate long, before adopting this proceeding, where there was no evidence of the existence of malignant disease; I should look upon it with great dread; and I should consider it as one of those exceptional modes of treatment which surgeons are sometimes driven to undertake, in consequence of encountering some extraordinary difficulty, not provided for by the legitimate and established rules governing surgical science.

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* If the head descend into the pelvis enveloped by the membranes, the os uteri being at the same time well dilated, the hair upon the scalp will, of course, not be felt; and the surface will give to the finger the sensation of touching something smooth and slippery. This might be mistaken for the thinned cervix uteri; the best diagnostic marks will then be the want of sensibility in the part against which the finger is pressed; and the not being able to feel the opening of the os uteri at the posterior part of the pelvis.

† There are some cases on record in which this alarming accident has happened. Mr. Scott, of Norwich, reports one in vol. xi. of the Med. Chirurg. Transactions, p. 292, where the os uteri, with a considerable portion of the cervix, was torn off by the force of the uterine contractions, and came away in an entire state, presenting the appearance of a circular fleshy substance, having a central aperture. The patient, a primipara, eventually recovered, after hovering for a long time on the brink of destruction. In the Dublin Journal, vol. xvi. p. 52, there is a case detailed by Mr. Power, on the authority of his colleague, Mr. Carmichael, in which the os uteri and a portion of the cervix, three inches and a half in diameter, parted from the uterus, and came away during delivery, by the crotchet. The woman recovered without a bad symptom. And in the Med. Gaz. for August 29th, 1845, p. 790, a case almost exactly similar may be found, reported by Dr. Reardon, of Tipperary. In this instance also, the os and a portion of the cervix uteri, five inches across, were

DISEASE IN THE OS UTERI CAUSING RIGIDITY.—Sometimes the os uteri is rigid from disease, particularly skirrho-cancer and cauliflower excrescence — states which do not prevent conception, but must give rise to more or less difficulty in labour.‡

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torn off during extraction by the crotchet; the patient ultimately recovering. In Guy's Hospital Reports, October, 1845, p. 173, Dr. Lever gives a case in which the os and cervix uteri were torn from the body of the organ, by the strength of the uterine contractions. The part was in a very fœtid condition. The woman was delivered by craniotomy after it had occurred; and died in ten days. In the Med. Gaz. for April 18th, 1845, p. 944, there is an instance mentioned where, in a patient of Dr. A. Davis, of Newry, the os uteri sloughed off six days after labour; the woman recovered. And in vol. xv. of the Dublin Journal, p. 503, Dr. Evory Kennedy is reported to have detailed to the Dublin Obstetric Society one in which two-thirds of the os uteri came external to the vulva, during labour, and was cut off. Here also recovery took place. These instances prove what severe injuries to this organ nature will sometimes surmount and overcome. I was on one occasion called in consultation to a case where the os uteri had entirely sloughed off, in consequence of the strong pressure to which it had been exposed for a great length of time during labour. The patient died in a few days; and the fact stated, sufficiently evident before delivery, I had an opportunity of verifying by dissection. It was a first labour, and there existed a slightly deformed pelvis.

* Principles of Mid. 5th edit. p. 412.

† Guy's Hosp. Reports, Oct. 1845, p. 185.

‡ It has happened to me to see some instances of labour in which the mouth and neck of the womb were extensively affected with cancerous ulceration; and one in which a cauliflower excrescence of two years' growth, and of large size, was attached to this organ. Two cases that I will mention occurred in patients of the Royal Maternity Charity, and I had been attending both for some weeks before labour. One of these women (in whom the whole disc of the os uteri was destroyed by malignant ulceration, the vagina being extensively affected also) went into labour rather prematurely; the process was so rapid, that the child was born before the midwife could arrive. The woman died in the second week after her delivery, and dissection

When the os uteri is diseased, we shall mostly find it irregular, knotty, and very painful to the touch. Symptoms indicating morbid change will probably have existed prior to labour; and—from the history of the previous sufferings alone—there can be little difficulty in ascertaining the nature of the case. If it be not much dilated; if we find it very thick, tuberculated, and in part ulcerated; if it be very tender; and if there have been

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proved the disease to have acquired the aggravated extent above described. In the other case, the os uteri was but partially destroyed; the remainder was thickly studded with skirrhous tubercules. The patient was worn down to the lowest ebb of life, and,—to lull the acuteness of her sufferings,—had been in the habit for many weeks of taking two ounces of laudanum daily. I was summoned by the midwife soon after the commencement of labour, and on my arrival I found that death had just taken place. There were unequivocal proofs that the child was not alive, and it was therefore useless to extract it then. On opening the body next day, the os uteri was found dilated to about the diameter of half a crown, partially ulcerated, the principal portion thickened, and exceedingly indurated. The membranes were ruptured; and although so short a time had elapsed from the commencement of uterine contractions, the patient had evidently sunk exhausted.

The lady who was the subject of the cauliflower excrescence had borne one living child seven years before the time I speak of; and my father had been attending her for nearly two years for the uterine affection, during which she had once miscarried. She became pregnant a second time, while labouring under the disease; abortion was threatened, but was with care averted. The membranes broke early on the morning of Sunday, May 26th, 1828, and uterine action came on at noon; when my father was called, he found the os uteri would just admit the tip of the finger. The pains continued strong all day, with scarcely any increase in dilatation; and at night an opiate was given, which procured an intermission of suffering, but no sleep. The process of dilatation went on very slowly through Monday, the pains continuing regular and powerful. I saw her for the first time at half-past eight that evening. The os uteri was then dilated to the size of a crown; and from its whole disc a fungous tumour sprang, which filled a large portion of the vagina: the cervix was exceedingly indurated all round; the pains were very strong, and the vertex was being forcibly protruded, with each return of uterine action, partially through the undilated and unyielding opening. Still, the constitution had suffered but in a slight degree from the protraction of the labour, although so intensely painful. It was considered that it would be premature to adopt any means for delivery just then; and it was arranged that I should remain up with her during the night. Very little alteration was perceptible till half-past three in the morning, when, under the influence of a violent contraction, she suddenly screamed out that the child was passing. Being in the room at the moment, I instantly made an examination, and found the head had escaped through the os uteri, and was occupying the pelvis: in about half an hour it was expelled. The child was alive, and is so, I believe, still. The placenta gave no trouble. From the rapidity with which the child's head passed through the os uteri, the violent shriek, and the rending sensation by which it was accompanied, I have little doubt that a laceration of the organ occurred; although, owing to the confusion of parts consequent on the presence of the spongy tumour, I did not detect any breach of substance; nor, indeed, was I anxious to disturb the tender structures by making a prolonged and very minute examination. For a fortnight she continued in imminent hazard, but at the end of a month was able to leave her room. I was in almost daily attendance on this lady for fourteen months after her delivery, when she sank, worn to a skeleton by pain, hæmorrhage, and serous discharges. So profuse was the exudation of that peculiar serous discharge, eminently characteristic of cauliflower excrescence of the os uteri, that for some time before her death she was compelled to use three dozen napkins in the four-and-twenty hours, each of which was perfectly saturated with moisture. This discharge was, for the most part, untinged with any colouring particles; but occasionally it possessed the whole constituents of the blood; and dangerous flooding at different times occurred.

previous symptoms of uterine affection—such as acute pains, occasional and irregular eruptions of blood, constant or very frequent sanious, fœtid, acrid, or serous discharges from the vagina, — we can have no hesitation in pronouncing that the os uteri is in an unhealthy condition.

Treatment.—Under malignant disease of the mouth of the womb, it is very possible that a natural termination may occur, as in two of the cases I have related in the note. It would, therefore, be proper to delay the application of any means of relief, so long as is compatible with the patient's present welfare; moderating, at the same time, excessive action and profitless suffering, by opiates taken into the stomach, or exhibited *per anum;* or by the inhalation of chloroform. In most cases, the patient's system will have been too much depressed, by the wasting nature of the disease, to allow of the abstraction of blood; nor, indeed, could we expect bleeding to be followed by relaxation of the organ, when its structure is thus morbidly affected. Nevertheless, we must affix a limit to our passive treatment; for, as in more ordinary cases, a period may arrive, beyond which we cannot trust to nature. Should we observe, then, incipient symptoms of exhaustion; should the pains begin to flag; and should an increased quickness of pulse, a more anxiously dejected countenance, or distressing attacks of vomiting, indicate immediate danger, it would necessarily become an anxious question, what means should be adopted in order to afford relief. Delivery offers the only chance of preserving the patient from speedy death.

But under the undilated state of the os uteri, which I am supposing, it would be impossible to apply the forceps, or use any other means compatible at the same time with the child's existence, and with the continuity of the mother's structures. We have, therefore, only the choice of either delivering by instruments, which must necessarily destroy the infant,—provided it be at the moment living,—performing the Cæsarean section,—or dividing the diseased part to a sufficient extent to permit the child to pass. I presume the abdominal incision would not be contemplated if the pelvis were of ordinary capacity; and we should, therefore, be driven to the alternative of either perforating the head, or making a division of the mouth and neck of the womb itself. Considering, then, that the woman labours under a disease which must terminate in death,—and that, probably, at no very distant period;—that the os uteri would most likely be torn in our attempts at extraction; that the incision would not necessarily be followed by fatal consequences,—whilst at the same time, after perforation of the head, the child must certainly be born lifeless,—I should prefer operating on the os uteri, unless, indeed, there were present the most unequivocal signs of the child's death: and I should even hope for the patient's survival for some time, being cheered by the result of the last case detailed in the note, in which I have not the slightest doubt that a laceration occurred.

RIGIDITY OF THE VAGINA AND PERINEUM. — The vagina and perineum are sometimes so rigid as to prevent the exit of the child; with this there often exists also rigidity of the sacro-ischiatic and coccygeal ligaments, which adds much to the difficulty of the case.

This state much more usually occurs with first than subsequent children; indeed, simple rigidity of the vagina and perineum, when the patient has borne a family, is very rare. Sometimes, rigidity of these organs singly may be the cause of delay; but it is much more frequently combined with the same condition of the os uteri.

Diagnosis.—There is little difficulty in detecting the existence of rigidity in the vagina and perineum; we may ascertain it by the firmness, dryness, narrowness, and want of distensibility, which characterize the state. The rigidity will sometimes exist to such an extent, that two fingers cannot be passed without difficulty up to the os uteri; and yet, even under this aggravated condition, the parts will most probably, in process of time, become moistened, softened, and distensible; they will eventually dilate, and the case may be naturally terminated. When this unfavourable constitution of the vagina exists, if the os uteri be widely open, and the pains be strong, great pressure will be exerted on the parts within the pelvis, and all the injurious effects of contusion and strangulated vessels may be eminently dreaded.

Treatment.—Here, also, it is our duty to endeavour to relax the rigid structures; with this intention, bleeding has been had recourse to, as liberally and almost as universally as under rigidity of the os uteri; but bleeding certainly does not possess the same power in this as in the case last under consideration. I am inclined to limit the use of the lancet to those instances where the rigidity is combined with heat, tumefaction, unusual tenderness, and unnatural dryness, — symptoms which denote that injurious pressure has taken place, and that inflammatory action has commenced. Opiate injections have also been generally adopted; but they seem neither of so much avail as in rigidity of the os uteri, nor indeed are they so much called for; because there is not such distressing pain experienced as when the head is being pressed strongly against the hard, undilated os uteri; but if the uterine contractions are exceedingly violent, an opiate enema may prevent laceration. Simple domestic clysters are also of essential service, and may be used in any case, if the situation of the head within the pelvis does not prevent their introduction.

Warm fomentations are sometimes of great advantage. Flannels may be dipped in hot water or a decoction of poppy-heads, and applied to the labia externa and perineum. They may be continued, with little intermission, for four or six hours at a time. The warmth is grateful to the patient, and their relaxing influence has sometimes shown itself in a manner not to be disputed. Another means of applying warmth externally is by desiring the patient to sit over the steam of hot water, provided she can maintain the sedentary position without great inconvenience: one principal use, however, of these latter means is to gain time, so as to allow the natural powers an opportunity of exerting themselves efficiently, and at the same time to convince the woman that our mind is directed towards affording her relief. Warm oil might be injected into the vagina, if the parts were dry, and harsh, and hot; and if the head were not lying too low to prevent the introduction of the fluid; but, generally, this will not be practicable, and lard will be found a more easy and useful application. The external parts may be lubricated by a little occasionally smeared over them; and a small portion may be carried as high as possible within the vagina, and permitted to melt there. I have often found this cooling application very grateful to the patient; and have fancied that, at the same time, it has tended to produce relaxation. I would, however, caution the student strongly against unnecessary, meddlesome interference: all *rubbing* must be avoided; and if this lubrication is used at all, it must be in the tenderest and gentlest manner; for much more injury will accrue from denuding the parts of their natural mucus, than good, from the artificial moisture which the unctuous substance affords.*

Chloroform is generally acknowledged to be endowed with the power of relaxing the muscular structures of the perineum; and consequently it is thought highly adapted to the case we are now considering, to prevent laceration taking place. That the so-called *sphincter vaginæ*, the *transversus perinei*, and those other muscles which encroach on the floor of the pelvis will become paralyzed under its use nobody can deny. In anæsthetic vapours, then, we have a means of overcoming this rigidity, which we did not possess until their properties were made known; and which may be found of great service for the promotion of this end, provided the cautions that I have before inculcated are not lost sight of.

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* Merriman (Synopsis, p. 29) says, the best method of using unctuous applications in these cases, is to introduce a ball of fine tallow, about the size of a nutmeg, high up by the side of the head, and leave it to dissolve and diffuse itself over the vagina. Thatcher (MS. Lect. 1820) prefers a liberal application of fresh butter, which, as being of greater consistence than lard, is more manageable.

It is impossible to paint in too vivid terms the dangers that may follow the use of the ergot of rye in the cases now treated of. There is scarcely an accident to which the woman in labour is exposed, but may be induced by its injudicious administration. In the two subjoined instances, I attributed the mischief that ensued entirely to its employment.*

It is a very common practice with the attendants, in lingering labour, to excite the patient to take stimulants, under the idea that her strength must be very much exhausted, and that some extraordinary means are required to sustain her. No custom can be more injudicious. Even in common cases great danger must spring from its adoption; but it is particularly to be deprecated where rigidity is the cause of delay: for, by increasing the power of the uterine contractions, stimulants will have the effect of forcing the head strongly against structures unprepared to admit it, and,—independently of inducing fever and premature exhaustion,—may occasion laceration of the organs which refuse to yield. For the same reasons, all voluntary efforts on the part of the patient must be restrained as much as possible; and—if from ignorance or obstinacy,—her officious friends persist in urging her to call those powers which are under her control to the assistance of the uterine energies, the injurious tendency of this advice must be candidly and plainly pointed out.

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* Late one evening, in the year 1829, after a very fatiguing day, I received a message from a midwife, requesting my attendance on a patient in labour of her tenth child. I was informed that the membranes had been ruptured more than twenty-four hours,—that the breech was in the pelvis,—that the uterus had acted very feebly from the commencement of the labour, but particularly so since the discharge of the waters,—and that the whole cause of delay seemed to be an insufficiency of pains. I directed an old and intelligent pupil, at that time resident in my house, to accompany the messenger,—to take with him some ergot, and to exhibit it, if he thought the case fitted for its use. He gave half a drachm, infused, immediately, and another dose of equal strength half an hour after. Ten minutes had scarcely elapsed from the administration of the second quantity, when the uterus began to act most powerfully: in ten minutes more the child was born,—wholly without artificial assistance,—and the placenta passed quickly with very slight discharge. He returned quite delighted with the powers of the drug. Early in the morning, however, I received a second summons, stating that the patient had experienced violent pains all night, had lost a large quantity of blood, and appeared very ill. On my arrival, I found her recovering from a state of faintness, and complaining of acute suffering at the lower part of the person. She had sustained a copious discharge of blood, as was evidenced by the appearance of the room; for a large quantity had soaked through the bed, and lay in a pool upon the floor. On placing my hand upon the uterus, I found it exceedingly well contracted, hard, and by no means tender; and it was plain that the hæmorrhage had not proceeded from that organ. Examining further, I discovered that the right labium was very much distended, and painful on pressure being applied. There was, indeed, a longitudinal laceration just within, extending the whole length of the labium; and the cellular structure of the part was filled with a very firm coagulum. On the removal of the clot, an oozing of artorial blood was perceptible, which, however, was restrained by the use of pressure and other means. An opiate procured sleep. In a few days healthy granulations made their appearance; in a little more than a fortnight the cavity was quite filled up, and a permanent cicatrix of about two inches in length showed the situation and extent of the injury.

At a later date, I was called, in consultation, to a case in which the uterus had ruptured after the exhibition of a dose of ergot. The accident might certainly have occurred had this drug not been given, but I had good reason to believe the medicine had mainly contributed to the lamentable catastrophe; there was a slightly distorted pelvis. I have known also some other cases of a similar nature.—Such are the dangers likely to arise from the administration of the ergot in cases unfitted for its use.

When the head presses on the perineum, the extended structures must be supported constantly and anxiously, lest they should rupture: the more rigid the parts are, indeed, the greater must be our assiduity; and this is occasionally a most distressing and irksome duty.*

CICATRIX IN THE VAGINA.—A cicatrix in the vagina, the result of sloughing under a previous protracted labour, will occasionally be found to impede delivery. When the healing process is established in the ulcer, which is left on the separation of the slough a puckering of the vaginal membrane takes place; the surface is diminished in extent, and consequently the diameter of the canal is lessened. In proportion to the extent of the slough, in general, will the difficulty be. The history of the case will be in itself almost sufficient to enable us to judge of the nature of the impediment. We shall find that the patient will have suffered one or more lingering, and probably instrumental labours; that symptoms of inflammation of the vagina occurred after one of the deliveries, and that her convalescence was protracted. On making an examination, we shall detect, at some portion of the vaginal surface, a fibrous, unyielding band, preventing the passage of the head. The edge of this band may be as thin as paper, or it may run up for a quarter or half an inch in length, narrowing the canal to that extent longitudinally.

Treatment.—It is very possible that nature, unaided, will overcome the difficulty offered by a cicatrix in the vagina; and it would, therefore, become our duty to wait a moderate time, that we may give her an opportunity of surmounting the impediment. Either relaxation may occur to such a degree as to allow the child to pass, or the fibrous band may lacerate under the strength of the contractile powers. Should the desirable softening, however, not take place,—rather than run the risk of extensive contusions, by the continued residence of the head in the pelvic cavity—rather than have recourse to forcible attempts to deliver by the forceps, it would be right to enlarge the passage artificially. Four slight incisions may be made into the edge of the constricted part: one towards each sacro-iliac symphysis, and one behind each groin, avoiding particularly the neck of the bladder, the rectum, and the uterine arteries which run up from below, one on each side of the vagina.* If four incisions be made, the least snip that can be formed will usually be sufficient; for it is more than probable that the aperture will be widened by laceration: and I am inclined to think this would be preferable to making an extensive cut, because of the danger we incur of wounding, not only the rectum or bladder, but also some of the large vessels with which the vagina is so liberally supplied. It would afterwards become a subject of consideration, whether the case should be left to the natural powers, or whether instrumental means should be resorted to, to terminate the labour: The answer to such a question must entirely depend upon the peculiar circumstances attendant on each case. After delivery, when the healing process begins to be established, care must be taken that a diminution in the capacity of the canal to any considerable extent does not again occur; and this would be best prevented by the introduction of a piece of sponge, dipped in oil, to act as a tent, and preserve the vaginal parietes distended. This should be changed two or three times a day, and its use persevered in for some time.

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* Hamilton (Practical Observations, p. 155) says, he has often had occasion to make counter-pressure from five to nine hours; and at p. 120, he states that he once supported the perineum, without leaving the patient for a moment, for twelve hours.

Notwithstanding the high authority of Dr. Dewees, I should by no means trust implicitly to the abstraction of blood, for the purpose of procuring relaxation of the cicatrized and constricted membrane. The American practitioners, indeed, used to be in the habit of carrying depletion, with this intent, to a degree which we seldom hear of in England. Dewees has given three cases, in which he attributes the relaxation of the cicatrix entirely to this means. In one of these instances, however, between sixty-five and seventy ounces were drawn at two bleedings; and another of his patients lost upwards of two quarts of blood at one operation, through the agency of the lancet, after a previous bleeding to the amount of twelve or fourteen ounces,—a quantity the abstraction of which few women in this part of the world would bear.†

UNRUPTURED HYMEN.—Impregnation has occasionally been effected although the hymen has never been broken; and if this membrane remained entire till the period of labour, it would form a greater or less impediment to the passage of the child. I have been consulted in one case of this description, and another has come under my father's personal observation. Such a cause of protraction must of course be met with in a first labour; and by this circumstance it could be discriminated from a cicatrix, the result of previous sloughing. Its situation would be just at the vaginal entrance, and its form would also assist us in determining its nature. The aperture must be dilated, if possible, by mechanical means, and if that cannot be effected, the case must be treated in every respect upon the principles just laid down for the management of a cicatrix.

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* Dividing a cicatrix in the vagina, the consequence of previous sloughing, must be regarded in a very different light from making incisions in the os uteri; it is an operation not nearly so dangerous, nor likely to be followed by such bad effects.

† System of Midwifery, p. 376.

Obliquity of the os uteri.—Another cause of delay attributable to the mother is obliquity of the os uteri; and this has been much insisted on by some continental writers.* It is certainly true, that when a woman has borne a large family, the abdominal muscles become relaxed, lose their tone, and cease to afford that support which the gravid uterus ought to derive from them: the abdomen consequently becomes pendulous; the axis of the uterus, in respect to the person, is changed; its fundus is thrown forwards, and its mouth is directed too much backwards against the sacrum. The upper part of the uterus has also been observed to fall to the right or left side, and the mouth to be turned towards the opposite ilium. Under such circumstances, we are recommended to place the patient either on her back, or on the right or left side, as circumstances may require, in order to admit of the body and fundus of the uterus gravitating in the proper direction. We are also instructed to draw the uterine mouth more into the centre of the pelvis, by the fingers hooked within it.†

As far as the change of the woman's posture is concerned, I can have no objection to the treatment; and I would, moreover, endeavour to retain the uterus in the necessary situation, by a bandage girt with moderate pressure round the person: but I am decidedly opposed to any forcible attempts being made to drag the os uteri into a more convenient situation; lest it should be lacerated or bruised, or excited to inflammatory action by the irritation necessarily attendant on our endeavours: and I have at best very little faith in obliquity of the os uteri producing serious protraction, unless, indeed, there be present at the same time more or less rigidity, or some disproportion between the pelvis and head. ‡

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* Daventer was the first to lay great stress on obliquity of the os uteri as being a very frequent cause of difficult labour. (Midwifery, 3rd edit. pp. 56, 234, &c.) The same idea was taken up about the same time by Peu (Pratique des Accouchemens, p. 582, et seq.), and has been adopted by Levret (l'Art des Accouchemens, par. 637, &c.), by Roederer (Elem. des Accouchemens, par. 440), and, in a modified degree, by Baudelocque (par. 262, et seq.), and other French authors.

† Baudelocque (par. 298), Velpeau (edit. Brux. 365), and others, recommend that the os uteri should be brought over the centre of the pelvic brim by means of the fingers.

‡ In corroboration of this opinion, see William Hunter's Anat. of Gravid Ut., p. 10; Denman's Introduc. to Mid. chap. x. sect. 5, art. 4; and Davis's Principles of

A DISTENDED BLADDER may retard the advance of the head, not only by prolapsing below it, as I have before described;* but by interfering with the efficient contractions of the abdominal muscles; which it will assuredly do, provided it contains any considerable quantity of urine, although it retain its natural position;—or by partially paralyzing the nervous energy of the uterus; and this effect I think I have seen produced by the agony attendant on its over distention in labour. In all cases of lingering labour it is highly necessary to keep the bladder as empty as possible, partly because its distension may delay the birth; but principally to prevent injury to its own structure.

A CALCULUS, situated at the neck of the bladder, if it be of large size, may offer an impediment to the descent of the head; and cases in point are on record.† The diagnosis would not be difficult; a solid, stony body would be felt at the anterior part of the pelvis, divided from the finger by the coats of the bladder and vagina. On passing a catheter or sound through the urethra, its extremity would at once come into contact with the stone; and doubt as to the nature of the case could then exist no longer The obvious mode of treatment would be to remove it by cutting down upon it through the vagina: which I apprehend would be an easy operation.

CAUSES REFERABLE TO THE OVUM.—PRETERNATURAL TOUGHNESS OF THE MEMBRANES is by no means a very frequent cause of lingering labour; nor is it difficult to overcome, when clearly distinguished: it is, indeed, by far more common for a premature rupture of the membranous cyst to produce a protraction of the process; since the passages are then deprived of the advantage of that soft dilating medium, which it offers when entire. If, however, the membranes be exceedingly strong, as occasionally they are,—although possessing their usual thinness and pellucidity,—it is evident that the very circumstance of the bag remaining whole after the full dilatation of the parts is effected, will necessarily more or less prolong the labour; since the ovum must either pass unbroken, or a greater force than ordinary must be exerted by the uterus to destroy its integrity. It is not to be expected that the ovum will be expelled whole, provided the term of gestation be nearly perfected; nor, indeed, is such an event desirable, because of the dangers which must accrue both to the mother and the fœtus:—to the mother, in consequence of the great probability of hæmorrhage, from the sudden emptying of the uterine cavity of all its contents at once;—to the fœtus, from

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Obstetric Med., p. 979. "Daventer, Baudelocque, and Desormeau, have attributed an undue importance to the obliquities of the os uteri." (Lee's Lect., Med. Gaz. April 13th, 1843, p. 83.)

* See page 230. † See Churchill's Theory and Practice of Mid. p. 220.

its being deprived of the means of life through the placental circulation, before it can enjoy the equivalent advantage of respiration.

I have already laid it down as a principle, that in ordinary cases, so far from desiring the early rupture of the membranes, we should be anxious to preserve them entire as long as possible;—until, indeed, the os uteri is perfectly opened, the vagina distended, and they have protruded somewhat externally. As soon, however, as they have appeared, in the least, outward to the vulva, we may suppose that all the advantage which can be derived from them has been gained; and, should they still resist the power of the uterine contractions, we may conclude that their preternatural toughness is retarding the exit of the head.

Treatment.—In this simple case it is only necessary to perforate the bag with the finger-nail, a pointed quill, or a stilette: the waters will escape; the head of the child will then enter the pelvis, if it has not previously done so; and—provided this be the sole cause of delay—the difficulty will immediately vanish.

HEAD PRETERNATURALLY ENLARGED.—The second cause referable to the ovum is a preternaturally large head, either from healthy formation, monstrosity or disease. It has been already stated,* that the size and weight of infants at birth vary exceedingly; that three instances are recorded where the child weighed considerably above sixteen pounds;—and we may naturally conclude, that when the general bulk so prodigiously exceeds the common average, the head will partake of the exuberant growth, and occasion a proportionate difficulty under labour.

In such a case, it is probable that the true cause of protraction will not be discovered until the head have entered the pelvis, or engaged somewhat in the superior strait. But its mere extraordinary size would not influence our treatment or abrogate the general rule—that we should desist from interfering instrumentally, until symptoms supervened, indicative of distress and requiring relief.

Rare as the last cause of protraction must necessarily be, it is still more uncommon for a monstrous formation of the head to impede its transit: the most usual irregularity in development is a want of brain; and, as in this case, the head is smaller than ordinary, such a malformation can in no degree interfere with its easy descent. But children are occasionally born with tumours attached to the cranium.* These usually contain fluid, and, however large they may be, from their compressibility they would offer but little resistance to the accomplishment of the process of parturition.

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* See page 85. To the instances already mentioned may be added that of a fœtus preserved in the museum of the Royal College of Surgeons in this city, which is said to weigh eighteen pounds. The portion of navel string attached to the umbilicus proves that the child could not have long survived its birth. It is stated, indeed, to have died in its passage.

A collection of water within the fœtal skull itself—constituting congenital hydrokephalus—is a less infrequent disease; though this is also very rare. It has been my lot, however, to meet with such an enlargement on many occasions. The quantity of fluid effused is sometimes almost incredible; three and four pints have been contained, together with the brain, within the skull.† Yet, although the relative proportion between the head and pelvis, necessary for the child's easy passage, does not exist; and the difficulty and danger must be in proportion to the dimensions the head has acquired; it does not follow as a matter of course that the woman would die undelivered, if art did not step in to rescue her: for I myself witnessed a case immediately after its termination, in which a head, containing a pint of fluid, was squeezed whole through the pelvis, to the great danger of the sacro-iliac ligaments and the pelvic contents.‡ In two other instances that came within my knowledge, where putrefaction had occurred to a considerable extent, the scalp burst, and the fluid was evacuated: the bones then collapsed, the difficulty was over, and the flattened head protruded. But in other cases,—and they are by far the most frequent,—instrumental aid will be found necessary before delivery can be effected.

There is great danger in allowing a dropsical head to remain for a long time locked in the pelvic cavity; because, from its compressibility, and the open state of the fontanelles, it so completely adapts itself to the shape, and moulds itself into the irregularities of the cavity, as to occasion strong, uninterrupted, and almost universal pressure upon the lining structures, to their imminent and certain hazard. We should naturally expect sloughing to occur: the bladder and the rectum might be implicated, and a fatal termination result.

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* See Perfect's 117th case. There is a preparation in the London Hospital Museum, where a tumour of a hernial character is attached to the vertex of an infant, more than half the size of the head.

† In my father's 68th and 69th cases (Practical Observations, Part I.; the 67th and 68th of the second edition), he supposed each cranium to have held many pints of fluid. In Smellie's case first, collection xxxi. (Cases in Midwifery), three pints were collected on the cranium being punctured; and in case twenty, collection xxxv., between two and three pints of water were poured into the skull after the child's extraction, through the opening by which the hydrokephalic fluid had been evacuated. In Perfect's last case, the head, extracted whole, the breech having originally presented, measured twenty-four inches and one-eighth in circumference.

‡ On arrival, I found the woman just delivered of a dead hydrokephalic fœtus, the circumference of whose head was eighteen inches. She suffered acutely after her labour from inflammation of the sacro-iliac ligaments, consequent on the distending pressure to which they had been subjected from within, and could not walk without support for ten or twelve weeks. This occurred in 1823. In the year 1827, I was called to another patient, who, just before I entered the room, had expelled a hydrokephalic child, after a very severe labour of more than sixty hours' duration. The head measured seventeen inches round; but I was not allowed to ascertain the quantity of fluid it contained. This poor creature died within a week, from the combined effects of exhaustion and inflammatory action.

Diagnosis.—Such being the dangers attendant on this case, it becomes a matter of the greatest possible consequence, that we should detect a hydrokephalic head as early in the process as possible: nor is the diagnosis generally difficult. We may ascertain the existence of the disease by the volume of the head being so much greater than ordinary, by the bones being so much wider apart, the fontanelles and sutures being so much more open and discernible, and by there being a certain degree of fluctuation evident within the skull. We must not, however, rely implicitly on the last-named symptom; for the pressure which the head is undergoing will very frequently prevent the sensation of fluctuation being communicated to the finger, even through the distended anterior fontanelle. These peculiarities it will certainly not be easy to discriminate before the os uteri is dilated to a moderate extent; or if we are content with inquiring by the first finger of the right hand: but I have before laid it down as a maxim, that we should introduce two or more fingers of the left hand, to determine the cause of delay, provided the labour be not progressing satisfactorily. Under such a mode of examination, if the head has descended low into the pelvic cavity, we shall be able to distinguish the considerable space which the sutures and fontanelles occupy in the general volume of the skull; whereas, if it remains above, an opportunity will be afforded us of introducing the chief part of the hand into the vagina, and thus detecting its preternaturally morbid size, by carrying the fingers around it, and gauging it, as it were, as it lies free and unimpacted at the brim.

Treatment.—Having, then, detected a dropsical head either above the brim, or partially occupying the cavity of the pelvis, what must be our practice?—Are we to act on the principles I have before so often enjoined, of waiting as long as possible, compatible with the patient's strength, before affording any means of relief?—Are we to incur the hazard of contusion, inflammation, laceration, and sloughing?—Are we to run the risk of the patient's powers becoming exhausted by useless struggles;—of her system being so much depressed as to endanger her sinking? I would reply to these queries by a decided negative.—When we have ascertained that nature is unable to overcome the difficulty except at a great expenditure of power, conjoined with imminent risk to the woman's life, we are fully warranted in having recourse to perforation much more early than if the child were healthy, that the fluid may be evacuated, and an opportunity afforded to the bones to collapse; the case will then most probably be terminated by the contractions of the uterus alone. I think myself justified in offering this recommendation, because of the danger of inflammation, and all the dreadful consequences which may follow impaction of the head, and because of the slight probability there exists of the ultimate preservation of the child's life. Suppose even that the infant was born living, is it likely to survive for any length of time?—Is it probable that the disease, originating in an early period of pregnancy, will be removed or even suspended?—Are we not rather to expect that it will go on increasing, to the ultimate destruction of the little sufferer?—Is the child, then, likely to be a comfort to its parents?—Is it likely ever to enjoy the perfect possession of its faculties, whether corporeal or intellectual?—Is it likely to become an useful citizen, or valuable member of society?—The probability is much against even the least of these advantages.—Can we, then, for a moment put the woman's safety in competition with the preservation of a hydrokephalic child?—If it be objected that life must necessarily be destroyed by adopting the measures just recommended, and that it is the duty of the physician to preserve life, if possible, under the most aggravated circumstances of pain, misery, helplessness, and fatuity, I would acknowledge this obligation on the part of the medical practitioner to the fullest extent; but I would also remark, that here is life at issue against life;—the life of the mother of a family, in other respects healthy, against the puny, slender, scarce animal vitality of an infant diseased beyond the hope of surviving, and with little chance of enjoying even the faintest gleam of intellect. But granting that the child should pass alive, and the woman also be preserved, her structures must be seriously endangered; and two miserable instances of sloughing, when the head was full of serous fluid, have come under my own immediate notice, occasioned by the praiseworthy—though in the case under consideration falsely-founded—horror inspired by the idea of craniotomy.* In following up this practice, however, let us beware of error;—let not our ignorance seduce us into a fatal assurance. Let us be *perfectly certain* of the existence of disease in the fœtal head before we take the perforator in hand. What an appalling and sickening feeling must overspread the mind of that man who plunges the dreadful instrument into the centre of the brain of a living healthy fœtus, under the erroneous belief in the presence of hydrokephalus! What would his sensations be, when, instead of the expected water, a stream of pure and unmixed blood flows from the inflicted wound! What bitter remorse must overwhelm him, when, after the keenness of the first shock has passed away, leisure is afforded him to contemplate the rashness and criminality of his conduct!—The mischief is done;—the death-blow is struck;—the act is irrevocable! *

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* See my father's 68th case of the first; 67th of the second edition.

UNUSUAL FIRMNESS AND MALPOSITION OF THE HEAD.—As occasionally an exuberance of growth takes place throughout the whole fœtal body, so at other times we observe some of the systems more particularly developed than others; and this is most remarkable in regard to the skeleton. The cranial bones partaking of this increased deposit of osseous matter become thicker, harder, and firmer than is usual; the membranous spaces which separate them from each other are diminished in extent; and such a degree of solidity is imparted to the entire head, that it is incapable of undergoing that compression which so materially lessens its lateral diameter, and so much facilitates its exit. Proportionate difficulty will therefore be produced under labour, and the same effects will result as though the head was actually of extraordinary size.

It is not probable that this peculiar conformation will be detected early in the labour; but when delay in the descent of the head appears, we may be able to satisfy ourselves, both that it is not larger than common, and also that it is more strongly ossified than usual, by the introduction of two or more fingers of the

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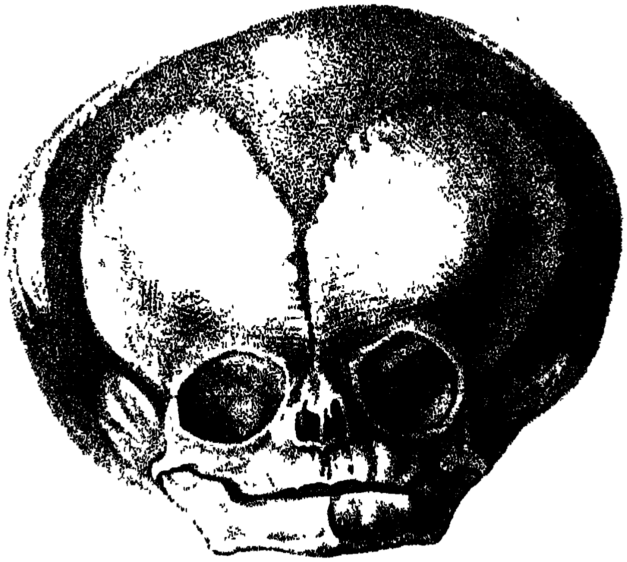
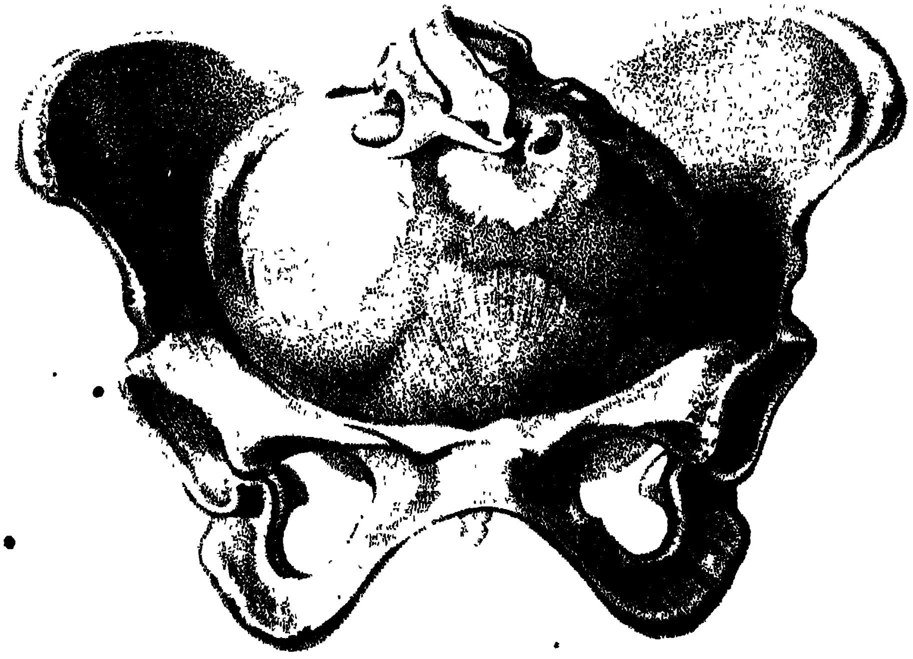
* See an instructive case of labour, complicated with a hydrokephalous fœtus, in the Medical Gazette, July 3rd, 1840, communicated by Mr. Robertson of Aberdeen. In this instance the woman died forty-five hours after delivery of her eighth child, from the effects of pressure occasioned by the head, which contained four pints of water, on the organs situated at the pelvic brim. I delivered a patient of a hydrokephalic child on May 29th, 1840, who had been in labour from Sunday, when the membranes broke, to early on Friday morning, when I first saw her. It was her second child; her first labour had been easy. The medical gentleman in attendance, hoping and expecting hour by hour that the case would soon be terminated, did not send for me till pressing symptoms of exhaustion had supervened. She did not rally in any considerable degree from the depression under which she was delivered, and died the same evening. This head contained nearly two pints of water. Most of the cases of this description which I have seen have been attended with great agony, especially in the pubic region, from the time the liquor amnii was evacuated till delivery, and some of them even before the membranes broke; and the patient, as in Mr. Robertson's case, has been exceedingly irritable and restless, rolling about in every direction, and with difficulty preserved in one position a sufficient time to make the necessary vaginal examination. This aggravation of suffering arises from the pressure of the distended cranium on the bladder and other tender structures at the pelvic brim, which, in cases of lingering labour from a more ordinary cause, are not subjected to the same amount of distress.

Fig. 2, plate 51, shows a dropsical head, which contained about twenty-four ounces of fluid, filling up the brim of a skeleton pelvis. Fig. 1 is a front view of the same head. It is impossible to regard these drawings, without being impressed with the cruelty we should be guilty of, were we, with a knowledge of the existence of the disease, to permit such an enlarged head to remain for any length of time either impacted in the pelvic brim, or wedged in the cavity. Fig. No. 1, of this plate, may be advantageously compared with No. 1, pl. 5.

Fig 2





left hand up to the pelvic brim, as before more than once advised. This latter information we may collect as well from the preternatural solidity of its feel, as from the indistinctness of the sutures and fontanelles, and the small space which they occupy.

Regarding the *treatment* of such a case, I have nothing to offer beyond the instructions so often inculcated;—that we should wait as long as is consistent with the woman's safety; and, when compelled, use those means most applicable to the case: the long or short forceps, if the head have descended sufficiently low to lie within their grasp: the perforator, if by its agency alone we can snatch the patient from impending destruction.

Having already fully discussed the subject of malposition of the head, when treating of the IRREGULARITIES OF HEAD PRESENTATION, no further notice of that cause of lingering labour can be required here.

ASCITES AND TYMPANITES OF THE FŒTAL ABDOMEN.—An effusion of fluid will sometimes take place during fœtal life into the thoracic and abdominal cavities;[*] both hydrothorax and ascites, however, as congenital diseases are very rare; the latter is perhaps the more frequent of the two. It is not likely that any difficulty to the passage of the child would be produced by a collection of water in the chest alone; nor would an abdomen enlarged from the same cause, however much increased in bulk, offer any impediment to the birth of the *head.* Delay, however, would occur in the transit of the *body;* and if means of relief were not applied, the woman might sink under her sufferings, although her child were partly in the world.

The case would be known by the shoulders remaining at the outlet of the pelvis after the birth of the head, resisting both the expulsive powers exerted by the uterus, and the extractive efforts made by the medical attendant. On the hand being passed into the pelvis, along the body of the child anteriorly, it would detect the abdomen, large and distended, soft and fluctuating, entirely blocking up the pelvic brim, and more or less filling the cavity.

If our endeavours to perfect the birth by traction at the neck, or by hooking the finger or some blunt instrument under the axillæ, were not crowned with success, we should be compelled to diminish the bulk of the body, by puncturing the abdominal parietes, and evacuating the contained fluid. This could easily be effected by a trochar, or even by the obstetric perforator. The only objection which could be started to the performance of this operation, consists in its apparent cruelty; but every consideration must give way to the preservation of the woman's life; and we shall generally find, that the child has ceased to exist before this means of delivery has become necessary. Unless it be breathing vigorously, the pressure exerted on the umbilical cord will most likely have destroyed it; and that pressure must have been great indeed, if we are unable to withdraw the body without making an opening into the peritoneal sac.

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[*] See my father's 67th case, Practical Observations, Part I.; 66th of the second edition.

Tympanites is the effect of putrefaction: and gas may be generated in the abdominal cavity, in the intestinal canal itself, and in the cellular structure underneath the skin.

We can have no difficulty in determining that putrefaction has occurred, after the head is born; the cuticle will desquamate most easily, and the scalp itself will be emphysematous. If, under this state of things, difficulty occur in the passage of the shoulders, we can be at little loss to understand the cause: and should we be disappointed in our attempts to liberate the infant by the finger, or blunt hook passed around the shoulder, we must here also perforate the abdomen, let out the air, and give an opportunity for the body to collapse. The diminution in bulk will then readily allow its extraction. When putrefaction has taken place, we cannot hesitate to operate in the manner recommended; for the child being certainly dead, no additional injury can be inflicted on its person.

Shortness of the funis umbilicalis has been regarded as another cause of lingering labour attributable to the ovum. It has been already shown that the umbilical cord varies to a very extraordinary degree, both in length and thickness, but particularly in length; so that it sometimes measures five or six feet, and in other cases it has been known scarcely to exceed six inches. Presuming that it is not more than a few inches in length, that circumstance alone has been supposed sufficient to prevent the ready passage of the head. This was particularly the opinion of the ancients, who considered that the child by its own efforts assisted greatly in liberating itself from its uterine imprisonment; and that these efforts would be frustrated and rendered of no avail, by its being tethered, as it were, to the uterus, and on that account incapable of effecting its extrication. I have, I trust, satisfactorily proved that the child is a perfectly passive body under labour; that no exertions of its own facilitate its escape; and therefore this reasoning must fall to the ground. Under the action of its fibres, the fundus uteri descends, and follows, as it were, the child's body: there is, therefore, always nearly the same distance between the umbilicus of the child and the placenta,—even though that organ be attached high up within the womb,—whether the uterus be perfectly quiescent, or whether it be acting vigorously. So far, then, as the head of the child is concerned, the shortness of the funis umbilicalis can produce no such impediment to its exit as to cause a lingering labour.*

But the case is different when the head has passed, and the shoulders are about to escape; then, if the funis umbilicalis be preternaturally short, or rendered so by being twisted round the body or limbs of the fœtus, a difficulty in the expulsion of the shoulders may be experienced, or dangerous consequences may be produced;—the placenta may be prematurely separated from its attachment, or its mass may be broken; a portion may be expelled, and the remainder, retained in utero, may give rise to violent hæmorrhage.

Diagnosis.—We may suspect that a preternatural shortness of the cord impedes the passage of the shoulders, provided we find, after the head is born, that the body of the child does not advance, although the uterus continues to act strongly; that no preternatural enlargement of bulk exists; and if on passing our finger up to the umbilicus, and endeavouring to pull down a loop of the cord, we find it tense and tight, resisting all our efforts to withdraw it.

Treatment.—In a case of this kind it would be right not to hurry the extraction of the child, provided it be breathing freely; but to obtain all the advantage derivable from the contraction of the uterus. By this means we shall best avoid the risk both of immediate and eventual hæmorrhage: for as the uterus contracts more perfectly, the body will be expelled, and the placenta will most probably be separated at the same time. A similar impediment may be produced, if the funis be coiled around the child's neck. I have already adverted to the possibility of this occurrence, the accidents it may occasion, and the mode of preventing them.†

UNUSUAL BULK OF THE TRUNK OR LIMBS FROM EXCESSIVE DEVELOPMENT.—MONSTROSITY.—We sometimes, though rarely, find that the different fœtal members do not grow in their just proportion, but that some are deficient, while others are abundant in development. Preserved in the London Hospital Museum there is a fœtus measuring in length twenty-four inches, whose shoulders are seven inches across, (the average width being under five;) while the cranium is smaller than ordinary, from there being a want of brain. Such a prodigious bulk would necessarily occasion difficulty after the head had passed; and the case must be met by the common means. Taking especial care, if the child be alive, and likely to live, not to injure the arm or the shoulder-joint, the finger, the corner of a handkerchief, or a blunt hook, must be insinuated first under one axilla, then under the other;

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* See Baudelocque, par. 1128; and Churchill's Operat. Med., p. 279, in confirmation.

† Page 136.

traction may be made by these agents; and by perseverance our object will generally be effected: for the compressibility of the viscera, and the elasticity of the thoracic parietes, are fortunately so considerable, as to allow of a great diminution in capacity, and permit the extraction of the body through a comparatively narrow channel. In making such efforts, however, we must bear in mind the delicacy of the structures on which our purchase is fixed: we may break the humerus, separate the epiphysis, or dislocate the head of the bone,—accidents all of serious consequence, provided the child survive its birth,—unless we use the power we are in possession of with the utmost tenderness.

It may be our fortune to meet with other more rare and more complicated species of monstrosity. Plates 78 and 79 delineate two specimens of double fœtus,* both having arrived at the full period of intra-uterine maturity;—the first, two perfect children joined together from the upper edge of the sternum to the pubes,—each possessing a head and proper complement of limbs;—in the second, the individuals are attached to each other by the side of their trunks; and the two heads are appended to a body double at the upper part, and single below, there being four arms but only two legs. The difficulty and danger attendant on such a birth must be great, and will come under consideration at a future opportunity.

All these causes, then, may operate to induce a lingering labour; some of them very much impeding the expulsion of the head, and others the passage of the body when the head is born. But the case may be complicated with still greater difficulties than have been described, by two or more of the causes enumerated, acting in concert. Thus, an unfavourable position of the head may exist, in concurrence with atony of the uterus, or rigidity of parts; or all three with a diminished capacity in the pelvic apertures.

THE MANAGEMENT OF A PATIENT UNDER LINGERING LABOUR requires to be even more strictly regarded than her superintendence in a natural and more common case; because her present comfort and future welfare depend much, as well on our own conduct, as on the rules we lay down for her guidance.

The chamber should be preserved cool and quiet, to avert fever and entice sleep. It is highly necessary that she should not be kept in one posture, because of the inconvenience, the irksomeness, and additional distress that a constrained position must occasion. She may stand, walk, or lie, alternately,—especially during the first stage,—or place herself in any situation under which she is least uneasy. We must, by every persuasive argument, prevent her from bearing down, or using any voluntary efforts, for the purpose of aiding the action of the uterus. The attendants in the lying-in room often suppose that, when a certain number of hours have elapsed since the commencement of the labour, a proportionate progress must necessarily have taken place; and accordingly, with the best intentions, they are constantly urging the patient to exert those powers which are under the influence of her own will, in the belief that such exertions will facilitate the child's birth. After what has been advanced, it is scarcely necessary to revert to the uselessness and danger of this untimely exercise of the assistant muscles: not only may the strength be prematurely expended, which should be husbanded for a future period; but injury may arise from the too forcible propulsion of the head against the undilated and unprepared passages.

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* In the collection at the London Hospital.

Nor must we think it immaterial to regulate her diet. I have already said that solid food should not be allowed under labour,—and this observation holds good, particularly with regard to a protracted state,—because the nervous energy being principally directed into other channels, digestion goes on but imperfectly. For reasons also before given, stimulants should be avoided: nourishing fluids may be taken *ad libitum*, and the blandest are generally the most desired. A great objection is often made to the exhibition of cold, and especially acidulated drinks, under lingering labour; on what grounds I cannot understand; and therefore I would by no means interdict them, if they are grateful and palatable. Effervescent draughts, and the subacid fruits, will often be found highly refreshing.

With regard to our own conduct, for the reasons before mentioned, we must abstain from frequent examinations, and from close attendance at the bed-side of the patient. By too great assiduousness during the first stage, we shall either impress her mind with injurious anxiety, or induce her to believe that the labour is on the point of being completed; and we shall perhaps be adding disappointment to bodily suffering. We must not be carried away by her calls for "help," however importunate she may be; but reason calmly with her, and assure her that, when the period arrives at which our assistance can be useful, our best endeavours shall be exerted to mitigate her sufferings. We must speak cheerfully both to her, and in her presence; and endeavour to preserve not only her confidence, but her spirits: for the feelings and the passions exert a most powerful influence over the progress even of natural labour.

The most important duty of all, however, which we have to discharge under lingering labour, is carefully to watch the state of the bladder. Every two or three hours we should place our hand on the vesical region, to ascertain whether it has become materially distended. It is less difficult to gain this information during labour than when the uterus is unimpregnated, because, in the latter case, the organ falls lower into the pelvic cavity, and becomes somewhat buried within the surrounding viscera: but when the abdomen is pretty nearly filled by the enlarged uterus, and the pelvic cavity is more or less occupied by the child's head, the bladder cannot retire either backwards or downwards, but is thrown upwards and forwards, and becomes so much the more evident to the hand. In making this examination—the patient lying on her left side—we pass the right hand upon the abdomen; and, presuming the membranes are ruptured, we feel rising, even above the umbilicus, a hard, firm, solid tumour, which is the uterus itself, on which we can make no impression, and which is observed to be sometimes harder and sometimes softer, in proportion as alternate contraction and relaxation take place in its fibres. Beneath this we shall find another tumour, more circumscribed in shape, occupying the hypogastric region, just peeping above the pubes, encroaching more or less on the cavity of the abdomen; varying, therefore, in size, according to the quantity of urine it contains, and giving a certain degree of indistinct fluctuation to the hand,—sufficiently perceptible, however, for us to determine that the tumour is the distended bladder. But we must not suppose that in all cases we shall feel the bladder, although it contain a considerable quantity of fluid, distinctly evident in its usual situation; because it may have subsided to the right or left side, and, instead of being found in the centre of the hypogastric region, it may be on one side of the enlarged uterus, appearing above one or other groin; or it may have prolapsed before the head of the child, (Plate 50,) as above described, offering itself as a soft tumour in the pelvic cavity. Having our mind, then, directed to such possibilities, we must not at once conclude that it is empty, although it may not be discoverable immediately above the pubes.

It is of the utmost consequence that we should not permit much urine to collect under protracted labour; not only because a distended bladder both adds greatly to the suffering endured, and interferes with the efficient action of the propelling powers, but also because of the danger incurred of injury to its own structure. It may burst,—inflammation may attack its lining membrane, which may terminate in the destruction of its coats; or a fistulous orifice may be formed between its neck and the vaginal canal,—which disastrous accident is much more likely to happen under an accumulation of water within its cavity, than if it be kept in a collapsed state.

For information respecting the condition of the bladder, we must depend only on our own personal examination, and not trust to the declarations either of the patient or the nurse. We are often told, in answer to a general question, that the water passes plentifully and freely; but if we are more minute in our inquiries, we find that some fluid dribbles away, as the patient lies, with each return of uterine contraction; and that no voluntary evacuation has taken place for many hours. This fluid may be the liquor amnii, or it may be urine squeezed out of the bladder by the compression exerted on that viscus by the abdominal muscles. In the latter case, it may be known by its urinous odour; and the very circumstance of its being forced out thus involuntarily is a proof of the cavity being over-distended, or at least of its containing a considerable quantity; for if it were entirely, or nearly empty, this dribbling would not occur. So far, then, from this circumstance satisfying us that the bladder is relieving itself sufficiently, it is the surest indication of the necessity there exists for having recourse to artificial evacuation.

The cause of this inability to pass urine under labour, will mostly, if not always, be found to consist in the stricture formed at the neck of the bladder, or in the course of the urethra, by the compression these organs suffer between the fœtal head and the pelvic bones.

Treatment.—When the bladder requires to be artificially emptied, the catheter must be used; and for this purpose, if the head is occupying any portion of the pelvis, the flat instrument is preferable to one of a round form; because it takes up less room in the antero-posterior direction. The woman need not be removed from the ordinary obstetric position; and the attendant passing the first finger of his left hand between the labia externa will discover the meatus urinarius just within the lower angle of the symphysis pubis, at the extremity of the smooth groove-like passage, named the *vestibule*. Guided by the finger, the point of the catheter is to be insinuated within the meatus, and with great gentleness the instrument is to be slid upwards, until about three-fourths of its length is introduced. To prevent its slipping entirely into the bladder, it should possess a rest or stop near its outer end; such an accident I have known twice happen, where this precaution would have obviated the occurrence.

But it is not always that the meatus urinarius retains either its natural position or its ordinary character and feel; for the urethra being pressed upon by the child's head, its lower aperture is forced downwards, and is thus thrown out of its common situation. If this pressure is continued for any length of time, the meatus and surrounding parts become swollen; and the opening no longer affords those peculiarities to the touch which it possesses in its more natural condition. Under this state of tumefaction and distension, the most experienced person may fail to recognise the orifice of the urethra by the finger; and if that be the case, it is far better to submit the patient to an examination by the eye, than to run the risk of the serious, and, in many instances, irremediable dangers, that attend on a continuance of over-distension. Should much difficulty be encountered in guiding the tube into the bladder, we must on no account endeavour to *force* a passage; but some new direction must be given to the instrument; and if our efforts are still unsuccessful, an elastic catheter must be substituted. The impediment met with to the easy entrance of the catheter may depend on the head being tightly wedged in the pelvic cavity, or it may arise from the urethra being twisted a little to one side, out of its natural straight course. In either instance, if any attempt is made to overcome the resistance by violence, the probability is that the point of the instrument will pass through the back part of the urethra and the coats of the vagina, making a new opening into the vaginal canal, and that it will run up to the os uteri; an accident that has many times come within my knowledge, and which is the more likely to happen, in consequence of the structures having been thinned by pressure, and perhaps having also suffered some softening, the result of incipient inflammation. When this has unfortunately occurred, it may be easily known by the exertion required for the introduction of the instrument; and by some of the fluids which the uterus contained—thick, greenish, or bloody—being evacuated through the tube instead of urine. Most frequently nature will repair such an injury after labour, and restore the urethra to a sound state; sometimes, however, a permanent fistula is the consequence.

It is scarcely necessary I should insist on our satisfying ourselves that the catheter is not plugged, or on the propriety of smearing it with some unctuous substance to facilitate its introduction. A small basin must be at hand to receive the urine as it flows.

INSTRUMENTAL LABOUR.

Although in skilful, and especially discriminating hands, obstetric instruments must be regarded as great blessings to the suffering sex, yet it is a question with some practical men, whether by their unnecessary and improper use they have not produced on the whole more injury than good.* During the long reign of barbarous surgery, there is ample evidence to prove that instrumental interference was often most unjustifiably had recourse to; and there is good reason to fear that many women have dragged on a wretched existence to the end of their days, the miserable victims of impatience, ignorance, or violence. There is also the same cause for apprehension, that in no few instances the child's, if not the mother's life, has been sacrificed, when patience, perseverance, and a proper reliance on the natural powers, were the only obstetric auxiliaries required.

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* See Blundell's Principles by Castle, p. 526.

I would not have it thought, by these observations, that I am unable to appreciate the advantages sometimes resulting from instrumental aid; or that I would draw an argument against a valuable measure from the possibility of its abuse. I know too well that Nature sometimes fails even in her grandest and proudest work—the continuance of the human species; and that occasionally both the mother and her offspring would be overwhelmed in one common fate, unless art stepped in to snatch them from impending destruction. But I would endeavour deeply to impress upon the mind of the young practitioner, that urgent necessity alone will warrant him in taking an obstetric instrument in hand; and that, when a choice is allowed him, he should leave Nature to accomplish her own purpose,—provided, indeed, he can with safety trust her.

In his practice he will find it much more difficult to determine the time when instrumental aid may have become necessary, than to administer that aid; and, unfortunately, he will find the most deadly means most easy of application. Many times, also, he may be almost persuaded, against his own opinion, to the adoption of those means, by the urgent and unceasing solicitations of his patient. I would entreat him neither to allow these considerations to weigh with his judgment, nor to let that less worthy motive, a wish to take advantage of the *éclat* likely to result from a successful operation, tempt him to act contrary to his own feelings of propriety.

Two species.—I have already arranged instrumental cases under the second order of difficult labours, and have divided that order into two species; the *first*, those which are accomplished by instruments perfectly compatible both with the life of the child, and the safety and continuity of the mother's structures; and the *second*, those in which either the child's body must be mutilated, or a cutting operation be performed on the mother's person.

Four kinds of instruments, differing essentially in their fashion and mode of application, have been used to overcome the lesser degrees of difficulty which we meet with; by the employment of either of these, the labour is reduced to one of the first species of this order: they are the long and short forceps, the vectis and the fillet.

The instruments resorted to in the second species of this order of cases are of a cutting character, and they may be resolved into two varieties—the *first*, those which are applied to the child, and are necessary for the performance of craniotomy, as the perforator or craniotomy scissors, the crotchet, the blunt hook, and the craniotomy forceps; the *second*, those which are applied to the mother's person,—by which the Cæsarean section is performed, or the symphysis pubis divided,—the scalpel, bistoury, and others, which are auxiliary, and sufficiently well known in surgery to require no particular mention here.

FORCEPS.

Among the most ancient writers on medicine and surgery we meet with no description of any obstetrical instrument at all resembling our forceps. Hippocrates,* indeed, and Celsus,† both allude to instruments for the purpose of facilitating difficult labour, but they were of a kind designed merely to extract the child without reference to its life: they consisted entirely of hooks and crotchets; and their use must necessarily have mutilated the fœtal body.

The first gleam of such a contrivance sparkles in the works of Rhazes, the Arabian, who, in the latter part of the tenth century, described a fillet supposed to be adapted to this purpose. We find in Avicenna, whose work appeared nearly one hundred years after Rhazes wrote, the obstetric forceps mentioned by name; but whether they were of his own suggestion, or had been in use previously, is by no means clear: it is generally believed, indeed, that he was the original inventor.‡

It does not come within the limits of this work to enter at all deeply into the *history* of the different powers suited to relieve the exigencies of parturition, but as the subject is curious and interesting, I have given a rapid sketch in an Appendix.§ I consider it, indeed, of much less importance to discuss the merits of the various alterations which the forceps have undergone, than to obtain a knowledge of the cases requiring their assistance, and the mode in which that assistance should be rendered. I am myself in the habit of using Denman's straight forceps; and these I recommend to my junior brethren, at least in the commencement of their practice, in preference to those with Levret's, or any other lateral curve, because each blade is, in shape, exactly similar to its fellow; either may be introduced first or uppermost; each becomes a right or a left-hand blade, according as it is adapted to the pelvis; and no thought or calculation is required as to which should be applied over the one or the other side of the fœtal skull;—which consideration in itself is very likely to embarrass a young operator, and may be the occasion of his failure. This instrument measures eleven inches and three-eighths from the extremity of the handle to the tip of the points; of which the blade occupies seven inches, the handle the remainder; the groove for the lock being three-eighths of an inch deep. The greatest width between the blades is about their centre, and measures two inches and seven-eighths; the space between the points is exactly one inch. The fenestra is in the shape of a kite, but considerably longer in proportion to its width: the blade in its widest part, near the extremity, measures an inch and three-quarters across; the extreme width of the fenestra being one inch and three-sixteenths. The blades spring from the locking part in a regular sweep outwards; there being no shank

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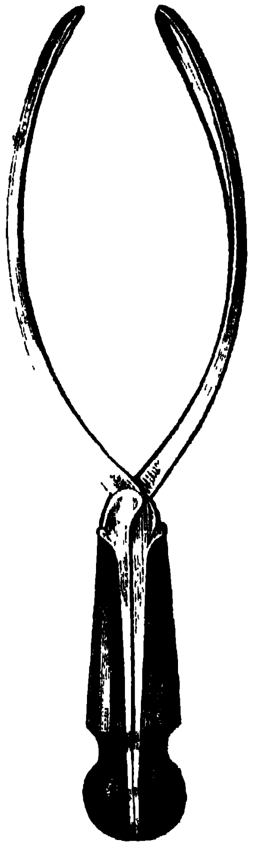
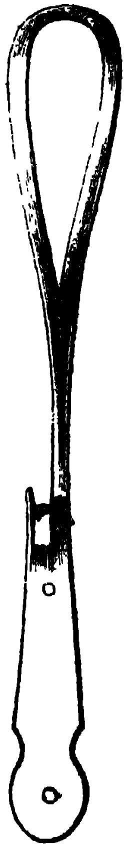
* Sect. iii. de Superfœtatione. † Lib. vii. cap. 29.

‡ After giving some directions, the application of which it is not very easy to make out, he says, "Liget (obstetrix) fœtum cum margine panni, et trahat eum subtiliter, valdè cum quibusdam attractionibus. Quòd si illud non confert, administrentur *forcipes*, et extrahatur cum eis; si vero non confert illud, extrahatur cum incisione, secundùm quod facile sit, et regatur regimine fœtus mortui."—Opera in Linguam Latinam Reddita, lib. iii. cap. 28—Fen. 21, tract 2. In this quotation we have a plain proof that both the fillet and forceps were in use among the Arabians.

§ See Appendix D. On this particular branch of the subject I can recommend, as an authority, Mulder's very erudite "Historia Forcipum et Vectium."


The instrument closed.


The back view of a single blade.

properly so called. The whole instrument weighs ten ounces and three-quarters.

Besides these peculiarities necessary to be attended to in choosing a pair of forceps, there are many others of less apparent moment, which must not be passed over without notice. They should be manufactured of the best tempered metal, else they are liable either to break or bend. The lock should be formed rather loosely, so that when the blades are adjusted one to the other, there should be a slight lateral motion allowed: for the space of at least an inch and a half from the handle, each blade should be of an uniform thickness, that it may be slid to that extent within the groove of its antagonist; for this, we shall find, assists much in its application under labour. No shoulders are admissible near the lock, no ornamental ridges, no serrated edges; every portion of the locking part should be perfectly smooth, and the corners rounded. The external face of each limb of the blade should, of course, be somewhat convex; so, indeed, should the internal also. All the instruments that I have ever seen have a rounded convex external surface, that the parts of the mother may not be injured; but in many the internal surface in contact with the child's face is flat. Every flat surface must have two sharp edges; and if strong pressure be applied, these edges will cut. To obviate the chance of disfigurement to the child, then, the inside of the instrument must be slightly rounded also.

Another point to be attended to is, whether the instrument should be coated. It was the old fashion to cover each blade entirely with leather, that it might be less formidable to the sight; that, in locking it, little noise might be made; and that it might be softer to the woman's person, and therefore not so likely to do injury. Many of the instruments depicted in Smellie's and other plates are finished in this way. This practice was, in my opinion, objectionable on many grounds. In the first place, the leather takes up room, and does not afford strength equivalent to the space it occupies; and we shall find in difficult labour, when disproportion from any cause produces the delay, that it is of consequence to gain even the minutest portion of an inch in space. Again, the instrument does not pass up so easily when covered with leather, as when it is plain and polished. A still greater objection, however, has been urged against this practice, and one that has caused it to be generally abandoned. It has been supposed that infection—the virus of syphilis or gonorrhœa, for example*—has been carried from a diseased to a healthy person.

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* Wallace Johnson (New System of Midwifery, 1769, p. 270) says, if the instrument is covered with wash-leather, "humours which are infectious may be absorbed and conveyed from one patient to another;" and, therefore, he recommends morocco

If there be the slightest probability of such a sad accident, it would be our bounden duty either to discard the leather entirely, or to change the covering after each time the instruments are used.

The only coating I would admit of is a covering of "gum-elastic," or a silver wash:* to this there cannot exist the slightest objection; and those who wish to be very *natty*, or are critically particular in regard to the appearance of their instruments, may, without any detriment to their efficacy or value, require them to be disguised under the specious semblance of the precious metals. Practitioners in the East or West Indies, and other warm climates, would do well to incur the additional expense of coating their obstetric forceps, as well as some other surgical instruments, not for the sake of appearance, but to prevent rust.

It must be evident, that when the two blades are adapted to each other, so that a compact instrument is formed, it becomes a lever of the first kind—the resistance being at one end, the moving power at the other, and the fulcrum between the two: it is to be observed also, that this fulcrum is situated at the joint; that it is fixed, and its seat cannot be altered; and that, in the action of the instrument, one blade so completely antagonises the other, as to leave but a slight probability of the mother's structures being seriously compressed, provided it be used with caution and tenderness. There is but one modern of repute, with whose works I am acquainted, that has altered the situation of the joint;—I allude to Assalini, so well known by his admirable surgical forceps for the purpose of securing arteries without the aid of an assistant. This ingenious surgeon has been by no means so happy in his attempts to improve the obstetric forceps; his joint is at the extremity of the handles; but he has added what he calls a *key* about the middle, which converts it into something like the common forceps, so far as the fulcrum is concerned.†

APPLICATION OF THE FORCEPS.—Before the short forceps can be applied, the os uteri must be entirely dilated, and the head must have come down into the pelvis sufficiently low to enable us to feel one or both ears distinctly. The instrument, indeed, can neither be introduced without difficulty, nor worked without danger, unless the mouth of the womb be fully opened; and it is necessary to touch one or both ears, because they become the

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leather to be substituted. He adds, "Indeed, danger may arise also from those which are covered with morocco, if care be not taken to wash them very clean with soap and water, after each time they are used. Nay, rather than neglect this, I could wish them not to be covered at all."

* Professor Simpson's forceps are coated with "gum elastic," which is not liable to the same objections as a covering of leather.

† See his Nuovi Stromenti di Obstetricia, p. 43

guide to the proper adaptation of the blades. To employ the forceps with advantage, then, the exact position of the child's head must be accurately made out; and this we learn by paying attention to the situation of the ears as regards the pelvis, and to the irregularities in their form. We keep in mind that the back part of the organ,—the helix, or flap,—is free and unattached, and looks towards the occiput; while the tragus is bound more closely down, and is directed towards the face. Thus the position of the ear, in respect to the pelvic cavity, informs us whether the head has made its turn; and the direction of the different points of the organ itself, determines whether the face is placed backwards or forwards, or sideways.

As soon as a necessity for instrumental interference appears, two questions of some importance will naturally offer themselves to our mind:—the first, whether we shall call in the assistance of another practitioner, to advise us by his counsel, to aid us in the operation, and to divide with us the responsibility of the case;—and the second, whether we shall apprise the patient of the necessity of such help, and obtain her sanction and approval. So far as the first question is concerned, narrow policy might perhaps whisper to us, that we should not unnecessarily throw our characters into the hands of a neighbouring, probably a rival, and perhaps not very friendly, practitioner. We may be led to argue, that we are giving him an undue superiority; that he may be tempted to take advantage of the confidence we repose in him, to worm himself into the good graces of our patient; that he may blazon it abroad he was consulted in a case so difficult, that we were incompetent to its management; and that to his judgment and dexterity the safety of the patient was to be attributed. A selfish and narrow-minded feeling might prompt us to reason thus; but I should hope there are few men in the profession who would be guilty of such a breach of professional etiquette—not to say of honour—as is implied in this suspicion.

But let us even look at the darkest point of the picture: we will suppose it probable that the person we consult may take advantage of our confidence, and endeavour to supplant us by specious misrepresentation: still I would recommend that the same principle should be acted on; and, strong in our own acquirements, in the integrity of our intentions, and the propriety of our conduct, that we should disregard the ill-natured aspersions which envy or malice may circulate to our discredit: for there is such a comfort in the division of responsibility, such a consolation in knowing, if the case turns out ill, that we have not acted entirely on our own judgment, but that another party has sanctioned the means employed, and that all has been done which foresight should suggest; that we should be unnecessarily adding to the anxiety we must undoubtedly feel, if we allow any petty jealousy to prevent our availing ourselves of the opportunity offered;—provided always, the loss of time which must elapse in seeking assistance would not endanger the woman's safety.

The second question can be more easily disposed of. I presume that no operation in what is called *pure surgery*, is undertaken without the concurrence of the patient, if conscious; and I do not know why we should place the obstetric branch of the science on a different footing, in this respect, from surgery in general. Many reasons would induce us to inform a woman of the necessity of relief being afforded her, and the propriety of the means we are about to adopt. If instruments are had recourse to surreptitiously, they must be employed at a great disadvantage; since we cannot, under these circumstances, direct her position and general management with sufficient accuracy: again, should it be subsequently discovered that artificial delivery has been practised, it will with great reason be presumed that the instruments were used for our own convenience, and not for her benefit; and should an unfavourable termination occur, we shall be most justly censured. Independently of these reasons, we have no object in concealing our intentions; for we generally find our patient quite ready to submit to our opinion, resigned to the necessity of the operation, and most willing to avail herself of those means of relief which we have it in our power to apply. Nay more; we shall often find greater difficulty in resisting the importunate entreaties urged both by herself and her friends to terminate the case, than to persuade them of the necessity, when that necessity exists.

Having, then, called in the advice and assistance of a medical friend, having concluded with him that the patient's safety demands that instrumental delivery should be had recourse to, and that the case is fitted for the use of the forceps; and having obtained the required sanction, we must sit down calmly and quietly by the bed-side, and determine most correctly the position of the head, if we have not learned it before.

There are eight situations of the head under which the forceps are available. The first is, where it has fully made its turn, with the face into the hollow of the sacrum, the occiput lying behind the symphysis pubis, or impinging on the upper margin of the arch, with the right ear towards the right ilium, and the left ear to the left side,—offering itself, indeed, at the outlet of the pelvis, in the position most favourable for its exit. (Plates 39, 52.) The second is, where the head has passed the brim, and come down into the pelvis diagonally, with the face towards the right sacro-iliac synchondrosis, the occiput to the left groin, the right ear under the right groin, and the left ear before the left sacro-iliac synchondrosis. (Plates 35, fig. 1, 38, 53.) The third is, where the head offers itself just in an opposite direction to the last, with the face looking backwards to the left sacro-iliac synchondrosis, the occiput forwards behind the right groin, the right ear against the right sacro-iliac synchondrosis, and the left ear behind the left groin. (Plate 35, fig. 2.) The fourth is with the face looking directly towards the right ilium, the occiput to the left, the right ear behind the pubes, the left ear against the hollow of the sacrum. (Plate 34, fig. 1.) The fifth, with the face to the left ilium, the occiput to the right, the left ear behind the pubes, and the right looking towards the sacral cavity. (Fig. 2.)* The sixth is, where the face has offered itself anteriorly, has passed down diagonally, looking to one or other groin, and has eventually been thrown behind the symphysis pubis, the occiput having turned into the hollow of the sacrum, the right ear looking towards the left ilium, and the left ear towards the right ilium; as would be the case in Plate 43, while the head was passing through the pelvic cavity, before the shoulders came to occupy the sacrum. The seventh case is where the head has also cleared the brim, with the face directed forward, but where the turn just described has not taken place, the face looking to the right groin, the occiput to the left sacro-iliac synchondrosis, the right ear to the left groin, and the left ear to the right sacro-iliac synchondrosis. (Plate 54, 36, fig. 1.) The eighth and last case is just the reverse of this again—namely, where the face comes down to the left groin, the occiput to the right sacro-iliac synchondrosis, the right ear towards the left sacro-iliac synchondrosis, and the left ear behind the right groin. (Fig. 2.)

When the head is placed in any one of these situations, and the symptoms require it, we feel ourselves warranted in attempting to deliver by the short forceps — provided the os uteri be fully dilated,—if we can feel an ear distinctly,—if there is sufficient space in the bony passages for the head to emerge,—and if the soft parts are sufficiently dilated to admit of its exit without suffering serious injury.

Before the forceps are introduced, the state of the bladder and rectum must be particularly attended to. Whether urine is detected by the hand or not, a catheter should be introduced, that we may assure ourselves of the organ being perfectly empty; and if any difficulty occurs in the insertion of the common instrument, a flexible tube should be employed. We must also ascertain that the rectum be not loaded with fæces; and if so, it may be relieved by a simple enema. It is not so necessary to insist on clearing out the bowel, as on the complete evacuation of the bladder; and, indeed, when the child's head is fully occupying the pelvic cavity, the stricture produced by it is so great, that it is with extreme difficulty a clyster can be thrown up; and even when injected, the fluid only partially returns; so that we shall generally be foiled in our intention of emptying the lower intestines. It is my practice *always* to introduce the catheter, but not to administer an enema, unless an accumulation of fæces in the rectum be evident to the finger, when introduced into the vagina.

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* See note at p. 109. As before remarked, these positions are not enumerated in the order of their frequency, but for convenience of description.

Mode of applying the forceps.—I will describe the most easy case first, as illustrative of the mode in which the forceps are to be applied, assuming that the face is in the hollow of the sacrum, the vertex presenting, and the perineum somewhat distended. (Plate 52.)

It is not necessary that we should accoutre ourselves in any particular dress, or even take off our coat, for this operation; but it is desirable that we should turn up our coat sleeve, unbutton the wristband of our shirt, and free the fore-arm as much as possible from any ligature which the tightness of our clothes might produce.

The patient lying in the common obstetric position—on the left side—must be brought so close to the edge of the bed, that the nates may project somewhat over it, the knees must be drawn up towards the abdomen, and the feet planted against the bed-post, or supported by an assistant. The object in bringing her so near the edge is, that the handle of that instrument applied over the uppermost ear, may be lowered, and its point easily introduced.* If we attempt to operate while she remains in the middle of the bed, it will be impossible to depress the handle sufficiently; and the point cannot be introduced unless the blade be carried up within the sacrum, and then turned forwards over the ear; by which a circular sweep of a portion of the pelvis is made, and the maternal structures might be endangered. It is to prevent the necessity of removing the patient at all, that some practitioners, as Hamilton, have adapted a hinge in the shank, and others, as Conquest, prefer a handle attached to the blade by a screw. The instrument having been warmed (by placing it in hot water, so as to bring it as nearly as possible to the temperature of the body), and greased with some unctuous substance, two fingers of the left hand, previously anointed, must be carried over the uppermost ear, which is generally the one most easily distinguishable. One blade of the instrument is then to be taken in the right hand; being gently poised between three fingers and the thumb, its handle must be lowered, so that the point may slip up towards the pelvic brim, between the fingers, and the head; it must be directed over the ear by the fingers, which are to act as the guide, and insinuated upwards by a gently waving or wriggling kind of motion. In the introduction the point must be kept closely in contact with the fœtal head: the attempt must be made in the interval of pain, and desisted from should uterine contraction occur; and if any material resistance oppose its passage, we must not endeavour to overcome the impediment by force, but give a new direction to the blade, a little more forward or backward, in whichever way it passes most easily; and thus gradually slide its extremity upwards, until its complete insertion. On its being so fully introduced, that the groove for the lock projects slightly beyond the external parts, it must be preserved in that situation by the little finger and thumb of the left hand, or by an assistant, and we must proceed to pass up the second.

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* It is of the greatest importance for the success of our operation, that the patient's position should be carefully superintended. I have myself known some instances of failure for want of this very necessary precaution.

This must be introduced, directed by the fingers, in a similar manner to the first; and if they are both properly applied, the groove of one blade will fall into the groove of the other, so that they will lock together without difficulty or exertion; and nothing is left for us to do but make extraction. If it should happen, however, as will often be the case, that when the blades are both introduced, they are not perfectly opposite to each other, and consequently do not lock easily, they must not be wrenched round, in order to make them fit,—for by so doing we shall bruise the woman's parts,—but we must withdraw the one last introduced, and pass it up in a different direction. We had better withdraw it two or three times than lock the blades by force.

Another point to be attended to in the application of the instrument is, that we should so introduce the blades, that the grooves to form the lock should be internal in respect to each other,—for if this be overlooked, it is impossible to fix them, unless each handle be forced completely round the other, or one be withdrawn. On closing the lock, we must be particular that none of the soft parts be pinched, and especially that none of the hairs are entangled within the grooves.

Our next indication is to extract; and we must do this with a regular, slow, waving, pendulum-like sweep from handle to handle, keeping the instrument back to the perineum as closely as we can, so that traction may be made in the direction of the axis of the pelvic brim. We extract with the right hand, while we support the perineum with the left. If there be pains, we take advantage of them, and act while they continue, resting in the absence of

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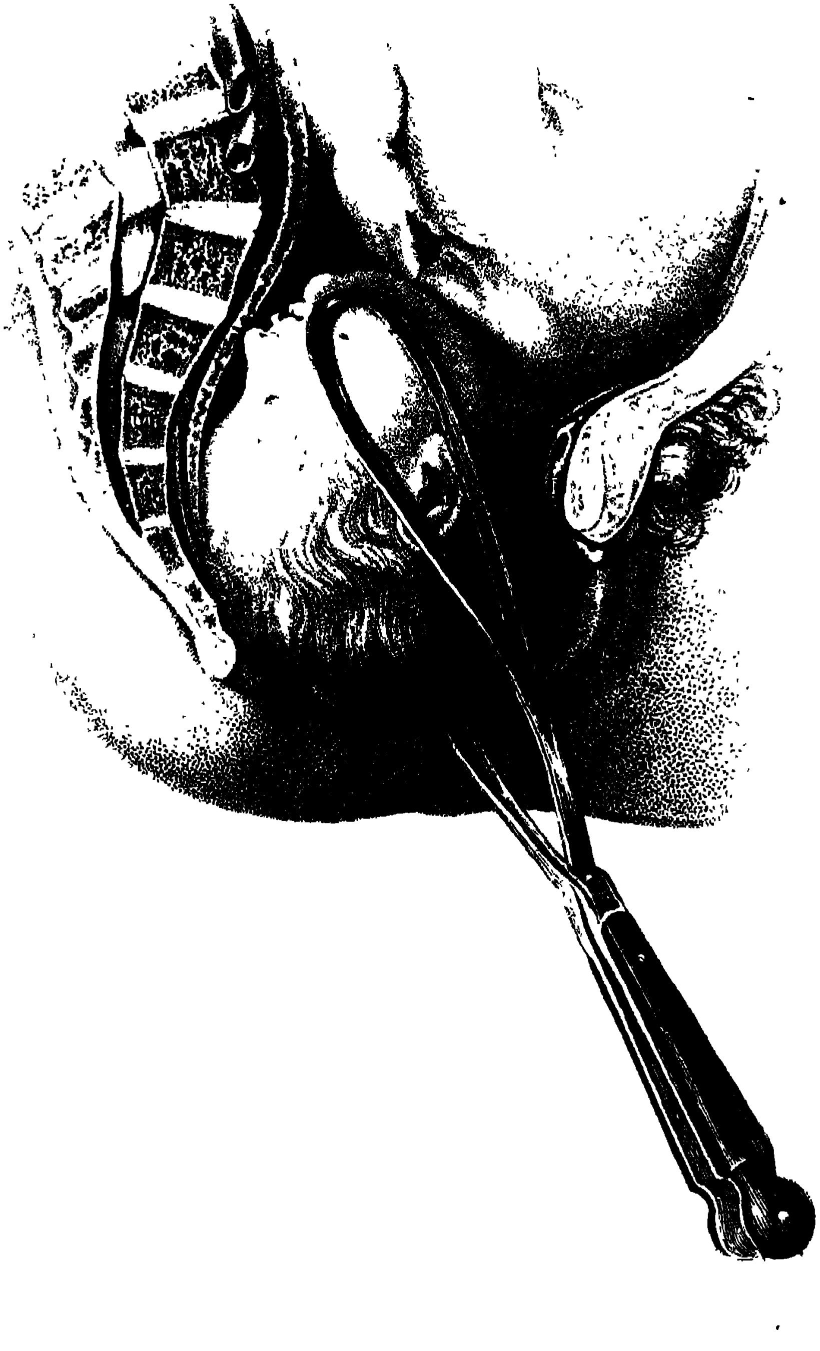


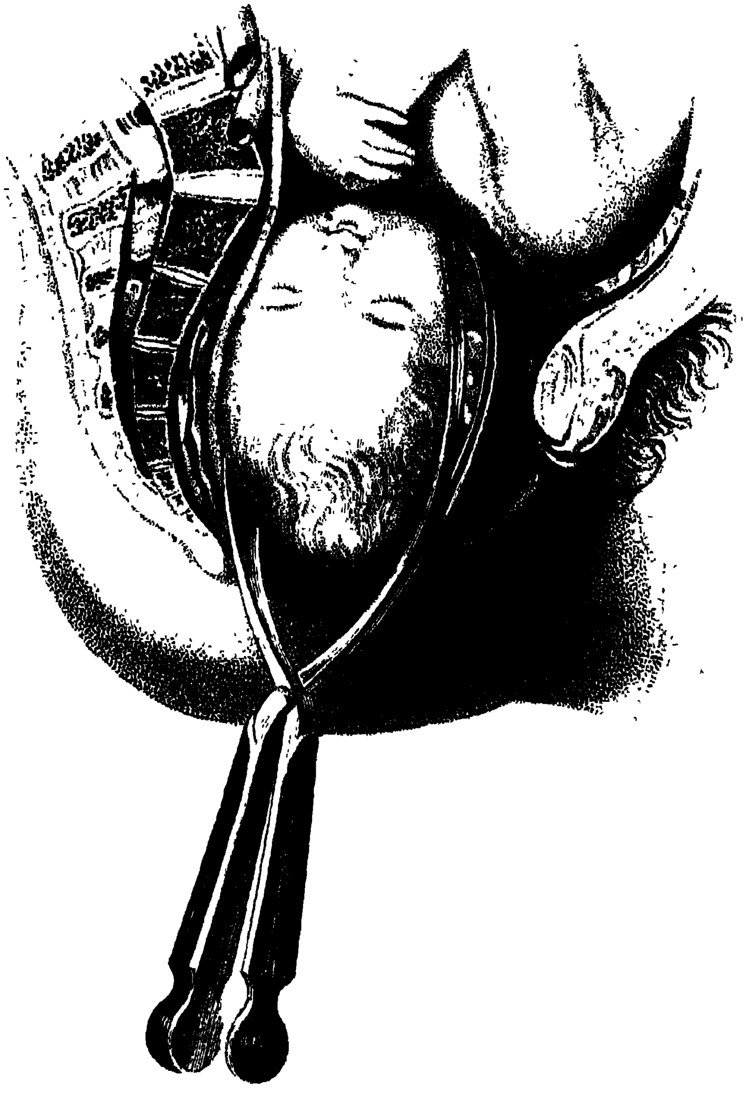
uterine contraction; and the child's head must be relieved from pressure, during the interval of action, by opening the lock. If there be no pains, we imitate nature, by working for two or three minutes together, and then relax in our exertions for the same period, taking care during the interval to guard the lock by the fingers, so that the blades shall not slip. In the course of a short time, we shall find that the head makes some advance,—that the perineum becomes more distended, and at last the vertex will appear externally. The direction of our power is then to be in some degree changed, and we must follow the axis of the pelvic outlet. We no longer keep the handles close to the perineum, but turn them rather forwards, and upwards towards the abdomen; and, by a continuance of the same pendulum kind of action, the forehead will emerge, and eventually the face and chin; during the passage of which, the perineum will demand our especial protection.

In most of Smellie's plates the handles of the forceps are tied together by a tape; and this practice is still adopted by many. I disapproved of such a ligature, because the hand possesses quite sufficient power to make the requisite compression; and because, if the pressure be continued uninterruptedly, the child's life must be placed in great jeopardy; and for these reasons I never myself employ it.

Cautiously and tenderly must this iron instrument be used! We must recollect that no sensation can be imparted to the operator's hand of any injury that may be done to the woman; and we must remember that one injudicious thrust, one forcible attempt at introduction, one violent effort in extraction, may bruise, may lacerate, may destroy! Bearing in mind, however, the kind of case in which it is useful and admissible;—bearing in mind the principle on which it ought to be employed;—recollecting that it is a lever of the first kind; — that the metallic blades have no feeling, and cannot communicate to our perceptions a knowledge of any mischief we may inflict, we are not likely to fall into any grave error in its application or its use.

Mode of applying the forceps, when the head has entered the pelvis, before making its turn.—But we may be driven to the use of the forceps before the head has made its turn with the face into the hollow of the sacrum, while it is lying diagonally with the face to the right (Plates 53, 35, fig. 1) or left (fig. 2) sacro-iliac synchondrosis, or laterally to the right (Plate 34, fig. 1) or left ilium (fig 2). It is very evident that in this case, although the head may be sufficiently low to enable the finger easily to command the ear, still it cannot be expelled or extracted, until it is placed in a more favourable situation for its exit. It has been already more than once demonstrated that the short diameter of the outlet of the pelvis is from side to side, and the long diameter from the fore to the back part, which is just the reverse of the brim; and,—inasmuch as the long diameter of the head, while lying in this position, is in the direction of the short diameter of the outlet, and nature will not effect the necessary turn,—we must perform it for her, before extraction can be accomplished. This is then a more complicated case than the one just described — the symptoms are the same—the reasons why we should employ instruments are the same—but the mode of using them somewhat varies. It is probable that in this case we shall not be able to feel the ear which is placed posteriorly; while that towards the pubes may be detected readily; and this is all that is necessary for our purpose: because, if we distinguish one ear, that will become an index to the other; and if we pass a blade over it, and make the second blade a perfect antagonist to the one first introduced, each must lie upon an ear respectively, and both must be properly adjusted. Having introduced the forceps with the cautions and gentleness before inculcated, the same pendulum-like sweep must be used for extraction; but, independently of our extractive effort downwards, we must make a slow rotatory motion, the wrist being directed outwards or inwards, — in regard as the face lies to the right or left side,—so as to throw it into the hollow of the sacrum; by which means we convert the case into one of the first kind. We can generally make this turn without any great difficulty; but before we attempt it, it is indispensable that we should have accurately learned to which side the face was originally looking.

When the face is towards the right side, our object being to turn it into the hollow of the sacrum, the motion of the wrist must be inwards, or that of semi-pronation; but when it is towards the left side, it must then be directed outwards, in the mode of semi-supination. But it will naturally be asked how we are to know when the face is in the hollow of the sacrum. This knowledge may be very easily acquired. If the blades have been applied over the ears, as they should be, the rivets in the handles will be brought into a line with the tuberosities of the mother's ischia, as soon as the head has completed this turn, but not till then. This being accomplished, extraction may be commenced. It is in the application of the instrument under this diagonal position of the head that the straight forceps are preferable to those with a lateral curve, in the hands of a young operator. The curved instrument of Levret and Osborn possesses a right and a left-hand blade, and requires to be adapted to the head, so that the convex edge should look towards the face, and be directed along the concavity of the sacrum, after that the head has made its turn, and is passing outwards; and it requires no little consideration, so to adjust the blades that the convexity may fit into the curve of that bone.



Should the *concave* edge, by mistake, be directed backwards, the points projecting beyond the child's head will rub against the posterior part of the pelvis, and most probably produce injury. It is by no means impossible that this accident may occur to one unpractised in operative midwifery ; and while such a *possibility* exists, it is much better to have recourse to those means which are least likely to do harm. The advocates for the use of the curved instrument allege that it embraces the head by more points of contact than the straight. This may be true ; but even granting their position, that superiority would not counterbalance the chance of disasters likely to arise from a mal-application of the blades.

Occiput in the hollow of the sacrum. — In the sixth case,— where the face has descended anteriorly, and the head has made a turn, with the occiput into the hollow of the sacrum, and the face behind the pubes (Plate 43), it has not taken a fortunate position for its eventual exit ; and although the woman may have had children before, still, it is very probable that this will not pass by the unaided efforts of nature. Our indication here is evidently to extract the child as it lies, although the situation is not the most favourable that could be chosen. I should presume no one would think of turning the face into the hollow of the sacrum before extracting, because nature has already accomplished the greater part of the difficulty — that of bringing the long diameter of the head into a line with the long diameter of the pelvic outlet. The same care is requisite in the introduction of the forceps in this case, as in others ; but, in extracting, the handles must be kept farther back towards the perineum, because the face will require a greater sweep to clear the pubes, than the occiput would if it were forward : the head does not adapt itself so commodiously to the passages ; the bones do not overlap each other so completely ; its general figure does not become so conoid, and consequently considerably more room is required for its transit.

Face towards either groin.—This situation of the head,—as the others, may be learned by the position of the ear, and attention to its figure. If the face is looking to the right groin (Plate 36, fig. 1), the right ear will be felt behind the left groin, with the helix directed downwards, as the woman lies on her left side : if to the left (fig. 2), the left ear will be discovered behind the right groin, with the helix directed upwards. But in making our examinations for this purpose, we must be careful not to double the flap upon itself, otherwise we may be lamentably deceived in regard to the direction of the face. The same care is also necessary in assuring ourselves that it has not come down into the pelvis so doubled naturally, as it will sometimes do when there is a want of room. The instrument must be introduced over the ears, in the same manner as before. In this case we have the choice of two methods by which to extract the head—we may either bring the face under the pubes, making a quarter turn along the half pelvis, or we may make a three-quarter turn, and throw it into the hollow of the sacrum. Of these modes I should certainly prefer that in which there is the least turn to be made — namely, with the face under the pubes,—provided it could be easily effected; because we are less likely to do injury to the mother, and also to the child. If we make a three-quarter turn, we may injure the mother's parts by bruising, or perhaps by laceration; and we might even destroy the child; for, if its body be strongly embraced by the contracted uterus, and do not follow the extensive turn which we cause the head to make, we must infallibly twist its neck considerably; and we might dislocate the vertebræ, to the destruction of its life. But although I recommend that an endeavour should be made to bring the child with its face forward, still, if it will not pass in that direction, without great exertion being used, rather than have recourse to a *forcible* effort, I would advise that the method of acting should be changed, and the face turned into the hollow of the sacrum. I have frequently effected this alteration in position, and that indeed with less difficulty than I anticipated.*

Here, again, we remark the superiority of the straight over the laterally curved forceps; for it is evident, if we apply a curved instrument while the head is in this diagonal situation, with the intention of causing the occiput to sweep the perineum, the convex edge must be towards the occiput, and the concave towards the face. If, then, we should fail in bringing the face under the pubes, and endeavour to direct it backwards, the blades must be withdrawn and re-adjusted, each over the opposite side of the head to that on which it was first adapted, to prevent the points of the instrument rubbing against the structures at the posterior part of the pelvis; since they would project considerably beyond the chin. Thus, by the withdrawal and re-adaptation of the instrument, the operation would be greatly complicated. As the straight blades, on the contrary, are perfectly similar in form, the rotation may be accomplished without in the least disturbing their position.

SYMPTOMS INDICATING THE PROPRIETY OF EMPLOYING THE FORCEPS.—Some practitioners of repute deduce their rule for the propriety of having recourse to the forceps, principally from time; they say, that when the patient has been twelve or twenty-

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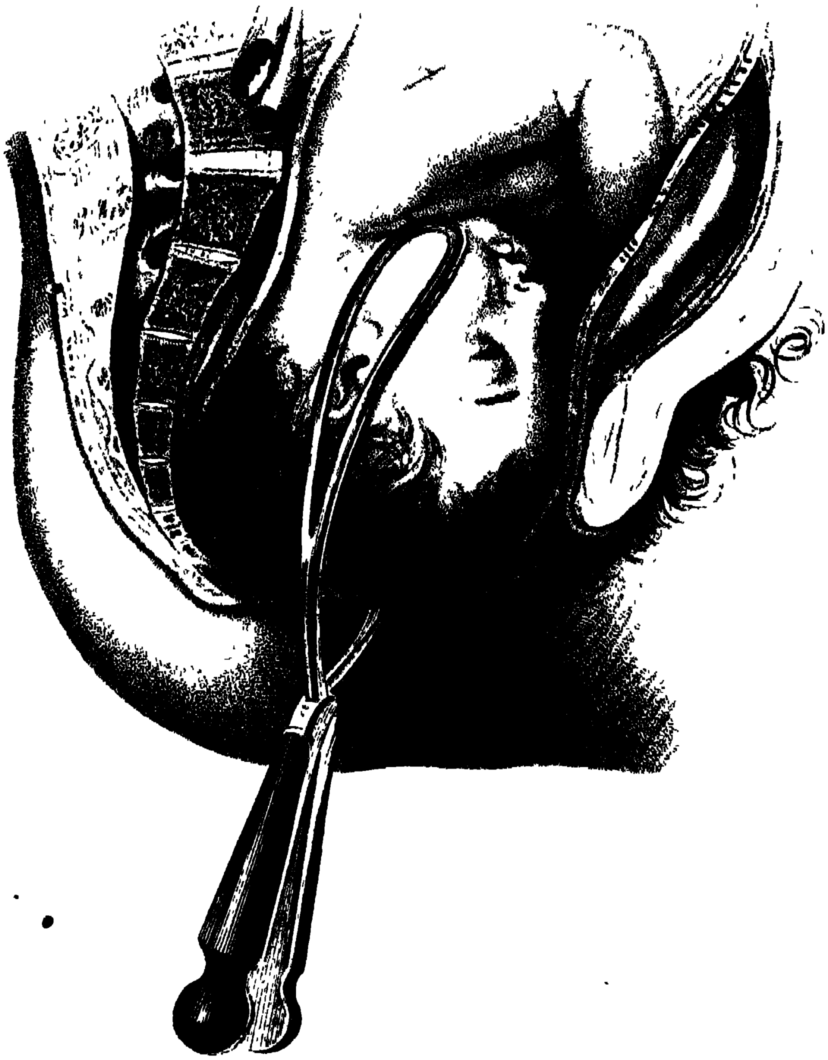
* Plate 54 shows the forceps applied, the face being directed to the right groin. The bladder is here represented considerably distended; under such a state the action of the instrument must endanger its structure.



four hours in strong labour from the period at which the membranes broke, we are warranted in having recourse to the short forceps, provided we can employ them without injury.* Though by no means of universal application, this rule is not to be despised: it must be received, indeed, with much limitation; because some women will bear up against the fatigue of labour for twenty-four hours with less exhaustion of the constitutional powers than others will sustain in six.† And the converse of this position holds equally good; for in some cases we should not be justified in having recourse to instruments, although the twenty-four hours had passed; because the system will have suffered comparatively in a trifling degree.

Others tell us that we are to pay little attention to time, but look chiefly to the symptoms present. This, to a certain extent, is also true; but the parts will not sustain pressure for a continued length of time without suffering injury. I have already mentioned, that should the head have been impacted for four hours without advance and recession, I think we are warranted in delivering, if merely for the purpose of preserving the soft structures uninjured.

Drs. Hunter, Denman, and Osborn, trusted cases of labour almost entirely to nature. Osborn,‡ in stating the symptoms requiring the use of forceps, says, "All the powers of life are exhausted, all capacity for further exertion is at an end, and the mind as much depressed as the body; they would at length both sink together under the influence of such continued but unavailing struggles, unless rescued from it by [illegible] of art." Here we recognize a complete wreck of the powers of life; and as Burns§ justly remarks on this passage, if such a state be allowed to take place, the exertions of art will in general prove as unavailing as the struggles of nature; if *all capacity* for further exertion is at an end, we can scarcely expect the system to rally. Denman‖ also says, "As long as the efforts of the mother continue with any degree of vigour, there is always reason to hope that they will ultimately accomplish the effect of expelling the child without any artificial assistance; in which case the use of the forceps is not required." Again, he says, "A practical rule has been formed, that the head of the child shall have rested for *six hours* as low as the perineum, that is, in a situation which would allow of their application, before the forceps are applied, although the pains should have altogether ceased during that time;" so that, if the head have been on the perineum two hours, and the woman be sinking from exhaustion, according to this rule, he would allow four more hours to elapse before he would think of having recourse to the forceps.

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* Blundell's Obstetricy, by Castle, p. 530.

† Early in the year 1834, I was called to a patient in a state of depression, from which she never recovered, although not more than six hours had elapsed since the rupture of the membranes. I delivered her under the worst symptoms of exhaustion, such as cold extremities and dark vomiting. She had been in health previously to the accession of labour; there had been no hæmorrhage nor laceration, nor any cause for her depression, except the fatigue consequent on great exertion. In this case death would probably have taken place long before twenty-four hours had expired, and probably before twelve.

‡ Essays on the Practice of Midwifery, p. 60.

§ Principles of Midwifery, fifth edition, p. 422.

‖ Chapter xi. sect. 4.

We must, however, allow to the recommendations of Hunter, Osborn, and Denman considerable latitude; for we must recollect that they lived at an age when instrumental interference was frequently had recourse to unnecessarily; that nature was seldom or never allowed to accomplish her object; but the hand was constantly being thrust into the vagina and uterus to dilate the parts; —instruments were being continually employed to extract the child; and the rudest means were used to bring away the placenta. A most beneficial object, then, was gained by the doctrines insisted on by these great men, and the strong language in which they clothed their instructions: a great revolution was gradually effected in the practice of the age, and obstetricians were taught to rely more implicitly on the powers and beneficence of nature. But however useful it might have been, during the lapse of the last century, to paint in glowing colours the dangers of instrumental interference, and the all-sufficient agency of nature, the cautions then inculcated are fortunately, in a great measure, uncalled for at the present time.

Were we to follow without reserve the guidance of those who regard nature as capable of surmounting all difficulties, we should be led to the conclusion that the mother's structures could not possibly be endangered, provided only the child were born without artificial aid; while, on the contrary, that they must necessarily receive injury under the use of the forceps, however skilfully employed. But these positions are both far from true; for, on the one hand, in many instances where the labour has been wholly unassisted, and the termination been perfectly natural, the pressure caused by the child's head on the parts within the pelvis has produced sloughing, and subsequent death; while, on the other, the instrument, if properly and tenderly applied, and used in a legitimate case, does not occasion more pressure or pain than would have been suffered if the case had been concluded by nature. During extraction, indeed, there may be some aggravation of suffering; but that pain is comparatively speedily terminated; and in the generality of instances, the aggregate quantity is less than the patient would have undergone, had she been trusted to her own powers, even if they had expelled the fœtus unaided. It may be supposed that the steel must produce more pressure than the child's head; and this may be in some measure correct; but it must be recollected also that, independently of the instrumental pressure being continued for a short time only, the closing of the blades occasions a diminution in the lateral diameter of the head, which must in the same degree relieve the maternal structures; the space thus gained being more than the thickness of the double blades.

To determine the precise period at which the forceps are required, or may be used with safety and advantage, is one of the nicest points that can be forced upon the attention of the practitioner. The principal evils that we have to fear, are the sinking of the patient's strength through exhaustion; laceration of the uterus or vagina; such a contusion of the vagina and perineum as will produce subsequent inflammation, suppuration, or sloughing; and inflammation of the uterus, from excessive action.

With these evils before us, we should steer a middle course between the two orders of practitioners just mentioned, and deduce our indications partly from time, but principally from symptoms; taking care, at the same time, that the patient's strength is not so far exhausted, before aid is given, as to render recovery hopeless; for surely that man who allows death to steal on by slow degrees, through his own ignorance, timidity, or supineness, is at least equally culpable with him who employs harmless means rather earlier than absolutely necessary, with the honest intention of relieving his patient from present suffering, removing her out of the chance of extensive injuries, or snatching her from threatened dissolution. It must not be supposed, however, that I am an advocate for the frequent employment of instrumental means, although of a character to do no injury. I merely wish to state my conviction, that such assistance had better be rendered, *rather before* it is actually called for, than be delayed till it be *rather too late.*

The rule which I offer for the guidance of the younger members of the profession is taken from a number of circumstances in combination. *First*, we must attend to the previous history of the woman. If she have hitherto been in good health, and is well formed, she is so much more likely to bring her child into the world without assistance; if, however, she have been confined for any length of time by illness, we should expect the powers of the system might not be sufficient for the end proposed. But this observation by no means applies universally, for in the last stages of the most debilitating diseases—such as dropsy and phthisis—the labour is usually terminated naturally. Again, if the patient has had children before, we should expect that this may be born also; unless, indeed, the head be very large, or strongly ossified, or wrongly placed, or dropsical.

Secondly, we must look to the duration of the labour. This is generally attended to by the patient and her friends (who are, of course, unable to form a judgment from symptoms,) more than any other circumstance. It is certainly a good general rule to consider that, if the labour has lasted twenty-four hours from the rupture of the membranes, there is a great probability that instruments will be required; and that, if the head has been impacted four hours, the soft parts must be much endangered.

Thirdly, we must regard the progress of the labour. If the head advances at all, and be not impacted, provided the strength and spirits are good, there is seldom need to interfere; but if no progress have been made for a number of hours, and especially if impaction* should have existed for four hours, then,—provided an ear can be felt,—and the parts are not so rigid as to endanger laceration, we are justified in employing the forceps.

Fourthly, we must consider the remaining strength. Women often suppose they are sinking, and will be earnest in their declarations that they have not strength left to go through their labour, when their power is unimpaired; although there may be a feeling of weariness. There is no term more frequently misused, than the word *exhaustion* is in the lying-in-room. The patient will often assure us she is perfectly exhausted, when the uterus is acting with undiminished energy; the solicitous friends will echo the same sentiment, while she is walking about the room, leaning on her nurse's arm.

Exhaustion is accompanied and known by a very quick pulse; if it be under one hundred beats in a minute, there is seldom occasion for apprehension; but if it have gradually mounted to one hundred and twenty, thirty, or forty, our suspicions should be awakened to the probability of approaching exhaustion. It is also known by the pains gradually subsiding in frequency, strength, and duration. We must not confound with this state the sudden suspension of uterine action, which we sometimes observe in the progress of the most natural labour, and which we can seldom account for; the pulse, tongue, countenance, and spirits, remaining good and unaltered: when the pains decline from a continuance of exertion, there are other accompanying symptoms which powerfully indicate distress.

Another proof of commencing exhaustion is a peculiar olive-coloured discharge from the vagina; and this symptom is not sufficiently attended to. I seldom or never saw a case in which exhaustion was approaching, that was not accompanied by this characteristic uterine discharge. Sometimes there is merely a stain on the linen, at others it flows away in large quantity. It possesses a faint and unpleasant odour, though not in the least putrid. This discharge has been looked upon as meconium mixed with the liquor amnii; and its appearance has been considered as a sure test of the death of the child, because it is generally supposed that when the head is presenting, the meconium would not appear externally, unless it had been voided from the bowels in the last death-struggle. I am persuaded, however, that it is not meconium; and I have known many children born alive, who had been declared dead, from this erroneous impression. I believe it consists in an altered secretion from the lining membrane of the uterus, consequent upon great exertion and long-continued action; * and look upon it as one of the first indications of exhaustion.

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* By the terms *impacted, jammed,* or *locked* head, is understood that state in which it neither advances during the presence, nor retreats in the absence of uterine contraction; when it remains fixed, occasioning strong, constant, and universal pressure on the soft parts within the pelvic cavity. It differs from the more simple *arrested* condition, which merely means such an absence of actual progression with each return of pain, as to render the labour *for the time* stationary; but in which the parts are relieved from continued pressure by the head receding in the interval of the parturient throes.

Again: exhaustion is known by the breathing being hurried, by the countenance becoming anxious, the eyes dull and sunk in their sockets, the appearance around them dark, and the cheeks exceedingly pale, sallow, or flushed in patches. The face generally assumes much of the character given to it in low fever.

The tongue will also guide us in our opinion. If the mouth is moist and clean, there cannot be much fever; but if the tongue become loaded with a white fur, fever is present; or if it be coated with a dry brown sordes, that is one indication of commencing exhaustion.

Vomiting also generally occurs in consequence of exhaustion from great exertion, as it often accompanies depression of the powers in the last stage of fever. The matter ejected from the stomach is of the same character in both cases; it is blackish, or has a coffee-ground appearance, and it may be fetid. We must discriminate this vomiting—as I have before remarked †—from that which occurs at the commencement of labour, dependent on the opening of the os uteri; nor is it at all probable that we shall fall into a mistake in this particular.

Shivering is another symptom of exhaustion, when it appears after many hours of suffering have been sustained; and it also indicates great local injury either to the pelvic structures from pressure, or to the uterus itself.

Coldness of the extremities, accompanied with clammy perspirations, is a very unfavourable sign indeed: if there be cold

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* See my father's Practical Observations, Part I. p. 270, first edition; or p. 156 of the second.

† Page 94.

sweats over the legs, arms, and neck, we may consider that the patient is in imminent danger.

If delirium be present, we may be perfectly satisfied that there is some mischief going on either in the uterus, the pelvis, or the head; and such a case would require extreme attention. We may, perhaps, be inclined to bleed. Delivery will often at once relieve this distressing symptom. Another state of mental aberration is that of low muttering. The woman lies quiet, appears to be talking constantly and rapidly, but her articulation is imperfect; and delivery affords the only chance of saving life under this state. These two last symptoms may be regarded as most dangerous; they are usually preceded by long-continued wakefulness; which, of itself, is one of the many proofs of exhausted powers.

The *fifth* indication is the state of the passages. If these are moist, soft, cool, and not tender,—if we can pass our finger all round the head easily, we may be sure that there is no impaction, and we need not deliver for their sake: but if the parts have become dry, hot, swollen and painful, so that the patient can scarcely bear the least touch upon them, then there must be injurious pressure, and,—to prevent sloughing,—we must terminate the labour, though there should be present but few of the general symptoms that I have mentioned; it is seldom, however, that local injury exists in any part of the body without the whole system sympathizing. If the patient be robust, we may bleed from the arm; if we cannot venture to take blood, we may use fomentations, and endeavour to remove the inflammation by such local means as are calculated to effect that object; and if the case be adapted for it, we may have recourse to the use of the short forceps. The longer the pressure is continued, the worse will generally the case become.

Finally, the state of the uterine tumour becomes an indication for delivery. If the abdomen be not tender on pressure, there is no inflammation; but if the application of the hand gives great pain, we have every reason to fear the approach of diseased action. There is no question that inflammation of the uterus itself may be produced by a long continuance of its excessive exertion; but as this is usually accompanied by diminished power in the general system, it is seldom to be removed by bleeding; under such a state, indeed, it would not be always safe to abstract blood freely: delivery offers the only rational method of relief.

Summary of Symptoms.—If, then, the pains are subsiding gradually, or have entirely disappeared,—if the strength is failing, the spirits sinking, the countenance becoming anxious,—if the pulse be one hundred and twenty, one hundred and thirty, or one hundred and forty, in the minute,—the tongue coated with a white slime, or dry, brown, and raspy,—if there have been two or three rigors,—if, on pressing the abdomen, there is great tenderness of the uterus,—if there be green discharge,—if there be preternatural soreness of the vulva, with heat and tumefaction of the vagina,—if the head have been locked for four hours, and made no progress for six or eight hours,—if the patient be vomiting a dark coffee-ground-like matter,—if there be hurried breathing, delirium, or coldness of the extremities,—then delivery *must of necessity* be effected, although the labour have not lasted the limited period of twenty-four hours, or even twelve: and we should be acting *most injudiciously* to allow the case to proceed until the four last-named symptoms appear, without relief being offered, if the head were within the reach of the forceps.

But so long as the uterus is contracting with energy, the strength and spirits good, the countenance natural and cheerful, the pulse under one hundred, the tongue and mouth moist and clean—so long as there is no vomiting, nor any rigors, nor heat, swelling, nor tenderness of parts; no green discharge, no pain on pressing the abdomen—so long as the head retreats in the absence and advances in the presence of pain, provided there be any progress in the labour from hour to hour—so long there can be no necessity for instrumental aid; although the case may have lasted considerably beyond the specified limit.

VECTIS.

Another instrument that has been much employed, with the view of extracting the child living, is the VECTIS or LEVER;* it consists of a single blade; and of all the varieties that have been fashioned, Lowder's appears to me to possess the most useful form.

Much uncertainty still hangs over the origin of the vectis; and we are without any positive records, either regarding the real inventor, or the precise time when it was first used. It is generally attributed to Roonhuysen of Amsterdam, and even now bears his name; but I am disposed to think that the elder Chamberlen, who certainly introduced the modern forceps into practice, was also the inventor of the vectis.* This, however, is a matter of little importance in a practical point of view; it is of far greater consequence that we should select the best form of instrument, provided we are induced to trust to it. It should be twelve inches long in a straight line from one extremity to the other, seven of which should be engrossed by the blade. The blade should not spring from the handle in a regular sweep, as is the case with the forceps; but it should possess a shank, nearly straight, for the space of three inches, retiring backwards, at a very small angle. The curve should then commence gradually, and the point should be bent forwards rather abruptly. The widest part of the blade should be near the point, about one inch and seven-eighths across, and the fenestra should be inclined to an oval shape, two inches and a quarter long, and an inch and one-eighth broad in the centre; the weight of the instrument should be about seven ounces. The specimen delineated in the cut possesses Saxtorffe's hinge; but this is of no advantage in its use; it is merely for the convenience of carriage. Others, as Gaitskell's, are made with the handle to unscrew, apparently with the same object.

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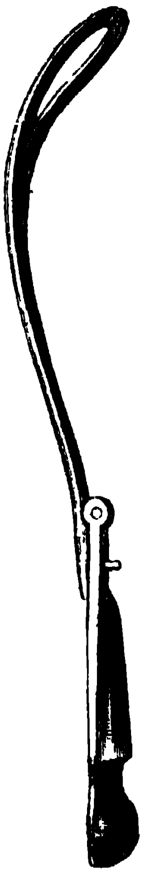
* I think both these terms highly objectionable; because if the instrument is used as a lever of the first kind, which is that most commonly known in mechanics, we can scarcely avoid making injurious pressure on the soft parts of the mother; and I object also to the term *vectis*, because that word, as employed by the Latins, carries with it an idea of force and violence; since *the vectis* was an engine applied to raise great weights, wrench open doors, and perform other acts requiring considerable strength. The names *extractor*, given to it by Dease, and *tractor* by Blundell, are much preferable to that of vectis, because they will lead to a safer use of the instrument in practice.


Lowder's Vectis.

Cases in which the Vectis is applicable, and mode of Using.—All the cases in which the short forceps are applicable, are supposed to be fitted for the use of the vectis: and the symptoms calling for its employment are necessarily also the same. Three modes of using this single blade have been suggested; either as a lever of the first kind, or as an antagonist to the left hand introduced into the pelvis, or as a simple tractor; which last, indeed, is the only safe method. Chamberlen and Roonhuysen used it as a lever of the first kind; and they made the pubes of the mother form the fulcrum.† I need not insist on the mischief likely to result from this mode of acting: it is merely necessary that attention should be called to the bladder, placed directly behind the junction of the pubic bones, to imagine the dangerous pressure to which it, as well as the surrounding structures, must be exposed, were we to adopt Roonhuysen's plan. The injuries inflicted, indeed, must have been frequent and great; and this led Pean in 1772, to suggest the possibility of delivering by the vectis, without making a fulcrum of the mother's structures. He proposed a practice, which is now sometimes adopted, of grasping the shank of the instrument with the left hand,—the outer edge of the little finger being applied towards the vulva,—making that hand the fulcrum, and pressing the extremity of the blade on the child's head, by raising the handle firmly held in the right. Though not so easy a method of delivery, this is much safer than that first recommended, and, *if used as a lever of the first kind at all*, the instrument should be employed in this manner.*

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* For some account of the origin of the vectis, see Appendix E.

† Camper; "Remarques sur les Accouchemens, et sur l'Usage du Levier de Roonhuysen." Mem. de l'Académie de Chirurgie, tom. v. p. 729.

Another mode practised was the introduction of the instrument over one side of the head, and the application of three or four fingers of the left hand upon the opposite, thus to act as an antagonist to the iron blade, and to obtain a perfect grasp of the head, as the forceps does. The forceps being regarded as a pair of artificial hands, so the vectis, if used in this way, must be looked upon as a substitute for the right hand. But it is evident that, if there be sufficient room in the pelvis to allow of the introduction of three or four fingers over the head, there can occur very few cases in which instrumental assistance is necessary. This mode of using it was first adopted by De Bruas, about 1775.†

In 1783, Dease of Dublin gave a new name to the instrument, which much influenced the mode of using it. He called it an *extractor*, and proposed, that on the point being carried fully over the child's head, the handle should be grasped tightly, and held firmly, by one hand, while the shank was embraced by the other, and the movement, that of steady traction downwards, should be given by that hand which embraced the shank, thus converting the instrument into a lever of the *third* species. He states his opinion, that if used as a lever of the first kind, it must always prove highly dangerous, "retentions of urine being the immediate, and involuntary discharge of urine the lasting, consequences of it." ‡ The mode recommended by Dease is that now generally adopted—that which I would advise the young practitioner to follow, provided he be inclined to call in the aid of the vectis.

This instrument, consisting of only one blade, and being very easily introduced, has often been employed clandestinely, and without the knowledge either of the patient or her friends; and

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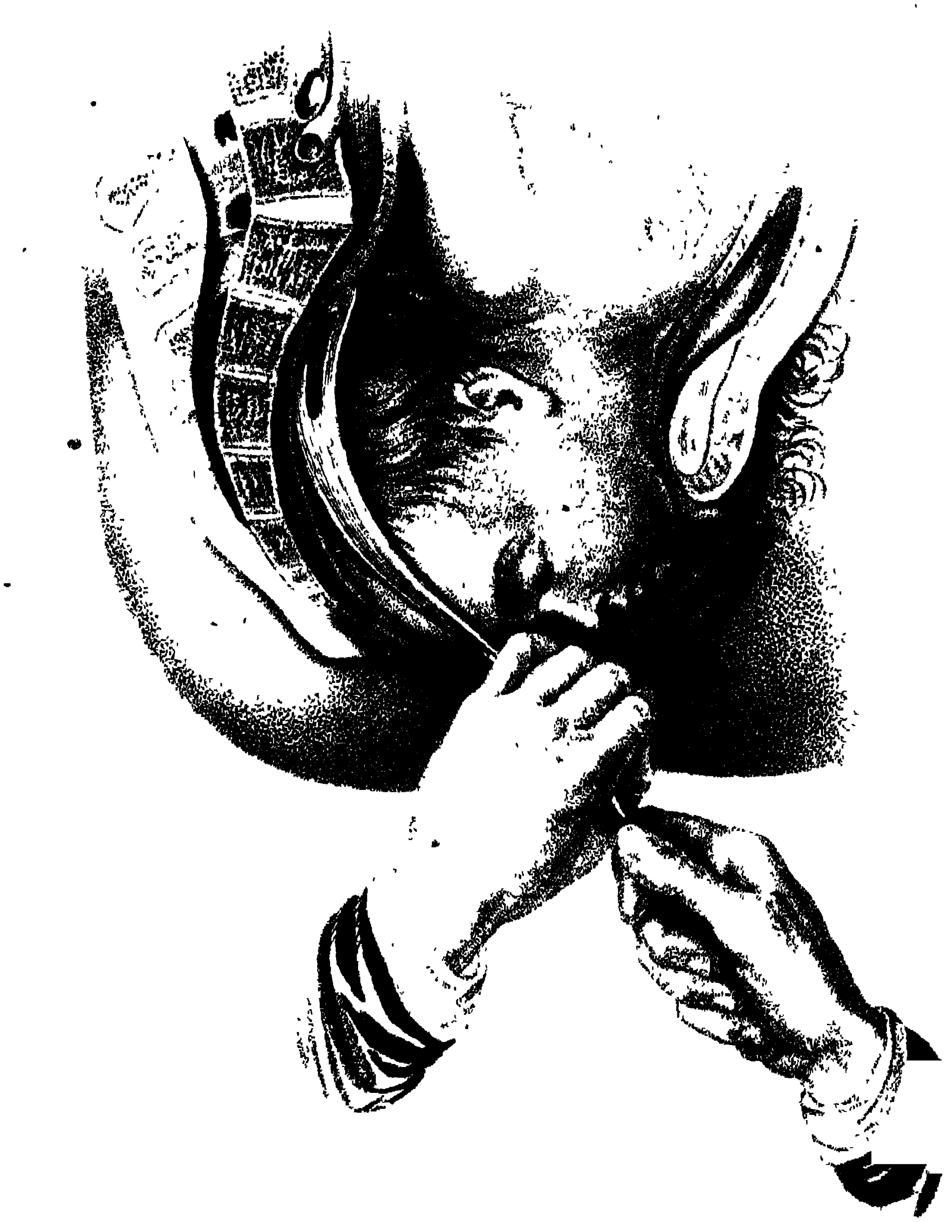
* See a treatise by Perret, a Parisian cutler, in *Descriptions des Arts et des Métiers*. Paris, 1772.

† The Practice of Using *the Spoon*, or *Scoop*, Restored; with a Short Account of other Instruments employed in Midwifery. By J. H. De Bruas, Middleburgh, 1755; in the Dutch language.

‡ Observations in Midwifery, particularly on the Method of Delivery in Difficult Labours. Introduction, p. 6.

Lowder, as one of the arguments in its favour, brought forward the facility with which it could be used, as a means of terminating the delivery *secretly*. It is not possible, in my opinion, to offer any better reason for discarding this instrument from practice, than that insisted on by Lowder, as one of its chief recommendations; for in this age, if any man accustoms himself to use the vectis, or any other obstetric power clandestinely, such interference must, in the end, lead to disgrace, and bitter self-reproach. In regard to the vectis, then, we should act exactly as with the forceps—inform the patient and her friends of the necessity of assistance being rendered, and never interfere unless circumstances demand our aid. Before the introduction of the instrument, the bladder must be emptied by the catheter, and the rectum unloaded also, if requisite. The same posture must be adopted as that previously recommended: the patient's person must be brought conveniently near to the edge of the bed, and the instrument warmed and greased. Two fingers of the left hand are then to be passed as high as possible within the vagina, over the child's head; the handle of the instrument must be held lightly in the right, and depressed sufficiently low to allow the point to slide up between the fingers and the head. The same kind of semi-rotatory motion recommended in the application of the forceps, will also facilitate the introduction of the vectis; and, —as with the forceps,—if any impediment occur to its easy passage, that must not be overcome by main force, but a different direction must be given to the blade, and the obstacle must be surmounted by gentle insinuation. On the complete introduction of the instrument, the fingers of the left hand are to be withdrawn, and the shank so grasped with that hand, that the little finger shall lie near the os externum, and the first finger surround the junction of the handle with the blade. (Plate 55.) Thus a firm purchase is obtained; and the whole instrument must be steadied with the right hand, while traction is made with the left. The extractive power must not be a constant, strong, uninterrupted *pull*, nor a succession of rapid *jerks;* but must consist of a number of short, steady, firm, extractive efforts, half a minute, or perhaps a whole one, intervening between them. The left hand must press strongly against the shank under each, so that the point may compress the head, at the same time that the handle remains stationary. Here also, as with the forceps, we must work during the continuance of contraction, and desist in its interval; and should the uterus be inert, we must imitate nature, making our traction only occasionally. This instrument is much more likely to lose its hold than the forceps; but as it is easily re-introduced, and as there is no second blade to adjust, that occurrence is of little importance.



In employing the vectis, then, we shall find it necessary to apply it over different parts of the cranium successively, in order to relieve the head from its fixed situation, and favour its descent; and we may sometimes feel it necessary to use it one minute as a tractor, and the next as a lever; being, however, most cautious to make the fulcrum of *our own left hand*, as first recommended by Pean. The occiput, and the projection behind the ear, answering to the site of the mastoid process, will offer the best positions for the application of the instrument's point.

The relative value of the vectis and forceps as obstetrical assistants has been the subject of much controversy. Some practitioners invariably used the vectis—as Bland, Lowder, Dennison, and Sims; others gave the preference to the forceps, among which number were Smellie, Denman, Osborn, and Hamilton; of the present British teachers, I believe almost all are in the habit of employing the forceps rather than the vectis; and the same remark applies to the Continental as well as the American practitioners.* We must, however, receive the recommendations even of practical men on this subject *cum grano salis;* we must recollect that early instruction is likely to prejudice every one in favour of any particular instrument, and that a certain degree of acquired dexterity in its use would probably attach him to it, and cause him to recommend it. Thus, then, although one practitioner may wield the forceps, and another the vectis, with the greatest advantage, it by no means follows, either that their pupils should be able to administer artificial aid with the same success, or that they should find the superiority of one instrument so decidedly outweigh that of the other, as they might be led to imagine if they listened to the doctrines of those practised exclusively in the employment of either. If, however, it can be shown, by legitimate arguments, that the one instrument possesses a decided advantage over the other, we are bound to use that means which offers the fairest prospect of success; until, indeed, by actual experience, we become convinced of the fallacy of our previously conceived impressions.

Arguments in favour of the Vectis.—The arguments in favour of the vectis are,—*first,* that there being but one blade, it is more easily applied; and that as the greatest difficulty in introducing the forceps consists in adjusting the second blade, that inconvenience is of course obviated. *Secondly,* that extraction can be more easily effected with it. *Thirdly,* that being so easily applied, it is not necessary for the operator to ascertain so intimately the nice obstetrical points connected with the case, or to make himself so minutely acquainted with the position of the head, as when the forceps is used. *Fourthly*, that it can be used in cases where the short forceps is perfectly inadmissible—before the head has descended sufficiently low for us to feel an ear; because we do not guide this instrument over the ear, but introduce it where we can most easily apply it, and where we can obtain the most useful purchase.

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* One of the first celebrated, and perhaps the most strenuous, of all the advocates in this country, for the vectis as the preferable instrument, was Dr. Bland. His arguments will be found in a paper by him, published in the second volume of the London Medical Communications, in the year 1790, p. 397.

Each of these arguments deserves a distinct consideration. In the *first* place, I would readily grant that the single-bladed vectis can be more easily applied than the double-bladed forceps; but I cannot accede to the proposition that delivery can be more easily effected with it—at least it is not so in my hands. I am not arrogating too much to myself when I say that I have had some considerable experience in instrumental cases. I can conscientiously affirm that I entered on practice quite unprejudiced as to the relative merits of the two instruments; and I have found it, in no few instances, easy to finish the labour by means of the forceps, when I had made trial of the vectis without effect. If such has been the case—as I have reason to believe it has—with others as well as myself, of what use is it to boast the easy adaptation of a power which, when properly adjusted, is so inadequate to the end proposed?—Again, we are told that, being so much more easily applied than the forceps, it is not necessary that the operator should be so perfectly conversant with obstetrical principles in general, or the particular points of the case under treatment. This, although a very specious, is, in my opinion, the most injudicious and untenable argument which could possibly be adduced in favour of this mode of delivery:—to prefer the vectis because it may be worked by a person who knows but little of obstetric principles, is, to say the least of it, placing a dangerous instrument in rash hands, framing an excuse for ignorance, and opening a wide door for violence and injury. I cannot but think that man highly culpable who would attempt to introduce the vectis without knowing minutely the bearings of the case under his care, or who was not sufficiently acquainted with the principles of obstetric science to enable him properly to adapt the forceps. Such a man would compromise his patient's safety, to say nothing of his own character. The *fourth*, and last, is the only argument which with me carries any weight in support of the vectis—that it may be used in cases where the short forceps is inadmissible, owing to the principal bulk of the head remaining above the pelvic brim: it is a longer instrument, and in its application may be passed higher within the woman's person than the short forceps can, being received somewhat, indeed, into the cavity of the uterus itself; but to overcome the difficulty of such a case, we are in possession of a much more efficient, and, in my opinion, even more safe instrument, in the long forceps: so that either with the long or the short forceps we may surmount all the impediments to which the vectis is applicable, under vertex presentation.

Positive advantages of the Forceps.—Besides these negative advantages, the forceps appears to me positively superior to the vectis in many respects. *First,* when we have applied the blades fully over the ears, we can generally turn the head into that direction most convenient for its exit. It has been already shown that if the face be coming forward, towards one or other groin, we may, most likely, find it necessary to turn it into the hollow of the sacrum before we can accomplish extraction, and that this turn can be effected with no very great difficulty; but we cannot do this with the vectis—we can only extract the head in that situation under which it is attempting the passage. *Secondly,* we can compress the head with the forceps, and diminish its lateral diameter so as to enable it to escape through a somewhat contracted aperture. It may be answered, that this can be effected with the vectis also; but when the head is compressed between the two blades of the forceps, the pressure is taken off from the mother's structures; when the vectis, however, is employed, the counter-pressure is made by the bony pelvis itself, and the soft parts lying between the head and the pelvic bones must suffer more or less from contusion. *Thirdly,* we are not in so much danger of injuring the mother, because, with the forceps, we have a fixed fulcrum, and consequently there is no necessity for us to form one for ourselves. To this observation, again, it may be answered that the vectis should be used as an extractor, and not as a common lever; and that therefore our argument is unfair, as being deduced from an abuse of means. In reply, I would observe, that the instrument is so much more easily used as a lever of the first than of the third species, and the fulcrum is so much more naturally made by the bony pelvis than our own hand, that in our anxiety to accomplish our object,—however determined we may be to the contrary,—we run a great risk of transgressing the rule, and endeavouring to *scoop* the head out. It will, of course, be understood that these remarks apply to young operators, and not to experienced practitioners.

These three principal advantages, then, which the forceps possesses over the vectis,—the being able to turn the head in any direction—its producing compression and diminution of bulk, without bruising the soft parts, and the comparative safety with which it may be employed—induce me to use it, and strongly recommend it in preference to the vectis. There are only three cases to which I think the latter instrument more suitable than the forceps; under presentations of the brow, face, or side of the head—the ear, for example. In brow presentations the vectis may sometimes be advantageously used—being passed over the occiput—to bring down the vertex, and prevent the case being converted into a face presentation; but this is seldom requisite, and can only be effected before impaction has occurred; again, where the face presents, and the head has become impacted in the pelvis, the case is more likely to be easily terminated by the adaptation of the vectis, as shown in Plate 55, than by the forceps: and the same remark holds good in regard to presentations of the side of the head, or ear. (Plate 47.)

FILLET.

The Fillet, or Lacque—an instrument, as it was originally formed, now very properly discarded from practice in head presentations—deserves but very little consideration. The first mention of such a contrivance occurs in the writings of Rhazes,* about the end of the tenth century, and became known under the name *laqueus*. It consists of a strip of strong cloth, silk, or leather, formed into a running noose, and was sometimes sewn up like an eel-skin, open at both ends, to admit the introduction of a piece of whalebone, cane, or wire, throughout its entire length, by which its application might be facilitated. It was intended to be introduced over the head in whatever way was most easily accomplished; and this done, the cane was to be withdrawn, the loop tightened, and extraction was to be effected by main force. We cannot suppose that the fillet could retain its hold unless it was actually passed over the chin, or round the neck; and if fixed in the latter position, it is very evident that the traction would have a tendency to double the neck upon itself, to turn the head to one side, and to form a most difficult and complicated case out of one which might, perhaps, have been terminated by the efforts of nature alone; because the power obtained could only be employed in one direction, and that in a straight line downwards. †

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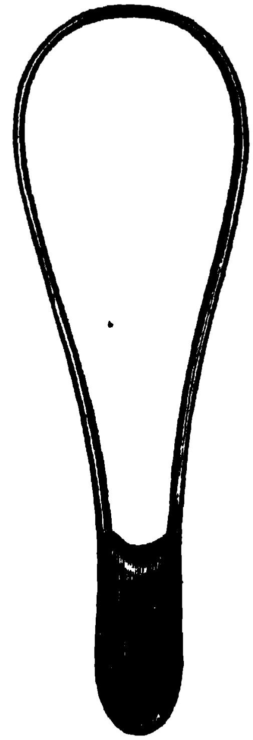
* Smellie's Midwifery, Introduction, p. xxxiii.

† I have never personally known this kind of fillet used in lingering labour; and I believe the last time it was employed in London is recorded by my late friend, Dr. Merriman, (Synopsis, p. 289,) in a case where his uncle was an unwilling spectator of the highest degree of violence inflicted by it, in the hands of a French physician. The force employed on that occasion was so great, that the head was severed from the body, and the poor woman, as might be expected, died on the second day after delivery. Smellie gives a plate of what he considers the best specimen of the fillet, communicated to him by Dr. Mead; and states, that it may be employed, provided the forceps are not at hand. In this recommendation, Smellie must have merely followed the fashion of the day; for his knowledge of the mechanism of parturition must have taught him that such a contrivance could

Within the last few years an instrument has been introduced, under the name of the "Whalebone Fillet," consisting of a loop of strong, though narrow, whalebone, large enough to encompass easily the head of a fœtus at birth, each end of which is fixed firmly into a handle. The length of the whole instrument is about ten inches; the loop seven inches and a half; and its extreme width three inches and a half. In its application, the loop is conveyed over the back part of the skull, and traction made by a steady pull downwards.



The Whalebone Fillet.

As I never made use of this instrument, I know nothing of its value from personal observation; though I understand that some practitioners, whose opinions are entitled to respect, employ it, and speak well of its capabilities. It must, however, labour under this great disadvantage, that it can possess no other action than that of traction in a straight line downwards, and consequently is unfitted for adaptation, except in those cases where the head is placed in a favourable position for its exit.

The same remarks apply to the suction-tractor suggested by Professor Simpson, as a substitute for the forceps in some *—though he does not propose that it should supersede that instrument in the generality of—cases.

Another mechanical contrivance has lately been invented by Dr. Evans, Professor of Obstetrics in Rush Medical College, U.S., which he thinks may supersede the forceps in all cases, "except where the head is so firmly locked that it cannot be moved." He calls it "the Obstetrical Extractor."† This instrument consists of a band or fillet to be placed round the head of the child above its largest circumference, by two "steel

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not be introduced if the head was impacted in the pelvis; and he must have been aware, also, that even if adjusted in the most fortunate manner, it could not favour the necessary turns, but was merely calculated to act in a straight direction downwards, and that, too, on the application of brute force. Vide Treatise on Midwifery, vol. i. p. 218. It is worthy of remark also, that Smellie neither delineates nor speaks of the vectis by name in any part of his works. In the preface to his second volume, (p. 7,) he certainly mentions "a print of the instrument used by Roonhuysen," which M. de Preville, the translator of his work into French, had added; but he does not call it by any name; and this is the only time the instrument is alluded to by him.

[*] Monthly Journal of Med. Sciences (Edinb.), Feb. 1849, p. 558. See also Obstetric Memoirs, vol. i. p. 498. For the suggestion of an instrument of this description, which he calls "the pneumatic tractor," as applicable to lingering labour, see Arnott's Elements of Physics, edit. iv. p. 650.

[†] North-Western Med. and Surg. Journ., April, 1850.

fingers"—in the manner employed for tying a polypus by the double canula,—and fixing the ends of the band together, so that it cannot be drawn off: from the band, straps pass down through the os externum, to be grasped by the hand, by means of which the extractive power is exerted.

Dr. Evans believes it can be used effectively, where the os uteri is dilated to a size not larger than a dollar; and that it is especially applicable where the head is detained above the pelvic brim; for the higher it is, and the "more loosely it floats," the easier will the adaptation of the instrument be.

I should doubt the possibility of applying such an instrument advantageously, where the os uteri was so little dilated, and the head so high, as Dr. Evans supposes; and in any case in which it *floated loosely* above the pelvic brim, if delivery were required, I should prefer operating by *turning* to the adaptation of any mechanical aid similar to the *Obstetrical Extractor*. Nor can I imagine that the position of the head could be changed by this instrument; on the contrary, it appears to me that the contrivance partakes of the imperfection common to every species of fillet,—that of being used only in a straight line downwards. Nevertheless, the idea of fixing a broad band round the child's head, beyond the projection of the ossa frontis, by which to obtain a purchase, is well imagined; and the mode of its application both novel and ingenious.

LONG FORCEPS.

One of the most valuable instruments employed in Obstetric Surgery, under careful management, is the LONG FORCEPS, if formed according to the size and dimensions subjoined, and used in those cases to which it is particularly appropriate; for although it must certainly be regarded as more capable of inflicting injury than the shorter kind, inasmuch as it is introduced higher within the woman's person, and its extremities are actually received somewhat into the cavity of the uterus itself,—still its powers and capabilities are such as frequently to render it a substitute for the horrible operation of craniotomy.* This value I have myself often experienced; for I have extracted many children alive by the agency of the long forceps, who had been doomed to death by other parties, and who must have been sacrificed to preserve the mother, unless we had possessed this instrument.

Although, however, the long forceps forms so useful an addition to our obstetric powers, the instrument was not generally adopted by practical men till about the commencement of the present century. Smellie, indeed, contrived a pair much longer than his common forceps, but he considered them so dangerous in use, that he hesitated to recommend them, and did not even display them in his lectures. Smellie, however, as will be shown, applied their blades in a very different manner from that which is now usually practised, and which I myself follow.

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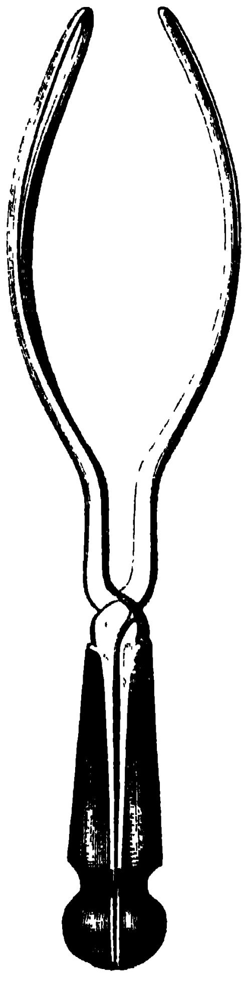
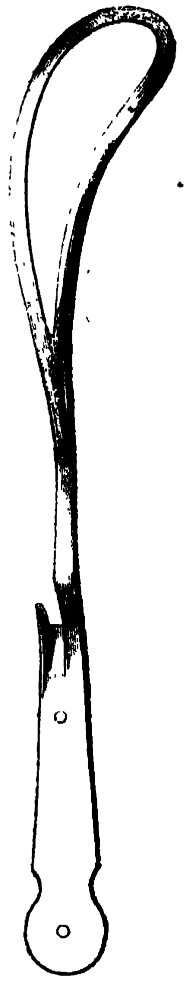
* "The forceps is the child's instrument."—Meigs.

Description.—The instrument which I have formed for my own use, and recommend to the practitioner, measures, from the



The instrument closed.



The back view of a single blade.

extreme of the handle to the tip of the blade, twelve inches and three quarters, of which four inches and a quarter form the handle, and eight and a half the blade, being one inch and a half longer in the blade than the short forceps, and a quarter of an inch longer in the handle. The greatest width between the blades is about their centre, and measures two inches and seven-eighths; the points are an inch asunder. The whole instrument weighs twelve ounces and a quarter. From the handles, two parallel straight shanks arise, of an inch and a half in length; and it is in the addition of this shank that the instrument differs principally from the curved forceps of Osborn, the belly of the blade springing, not from the handle, but from the extremity of the shank. The object of this addition is to prevent laceration of the perineum, in the use of the instrument; for if the long forceps of Smellie or Haighton be employed, in which the curve takes its origin from the handle itself, the mother's structures at the outlet of the pelvis must necessarily be pressed upon unequally by the commencement of the blades, before the head has descended low enough to distend them uniformly; and thus great danger of injury must ensue. In choosing an instrument, as remarked in regard to the short forceps, we must be particular that the internal surface of the limb of each blade is slightly convex; and the joint should be loosely formed, so that the handles, when locked, should be allowed a considerable play upon each other laterally. The shanks, too, should be of the same depth throughout their whole length; so that each blade may slip along, within the groove of the other, from end to end of the shank. In some cases, this will much facilitate the adaptation of the second blade.

The instrument, delineated in the cut, possesses a slight lateral curve, and although I prefer a *straight short forceps*, I think the curve an useful addition to the *long* kind. In the arrangement of these blades, there is not so much risk that we should apply them wrongly, as when we use the curved short pair; for as they are always to be introduced in reference to the *pelvis*, and not to the *particular position of the head*, we cannot well mistake which blade is to be passed uppermost.

State of the parts requisite for its introduction.—As I have already mentioned that the points of this instrument are passed within the os uteri, the student will at once perceive that it cannot be used if the mouth of the womb be undilated and rigid; for although we might be able to insert each blade separately, still, when they are closed, the two handles cannot be brought near each other without the os uteri being pressed upon, bruised, and perhaps lacerated. It would be too strong a position, to lay it down as a general rule, that that organ must be *entirely* dilated before the instrument is had recourse to:—to such a degree, indeed, that we shall not be able to feel the least part of its disc; because there are a great many cases in which it is pinched between the head of the child and some points of the pelvic bones,—is prevented from full dilatation, by being held prisoner, as it were, by this pressure—and consequently, in which a great portion of its substance,—both anteriorly, towards the pubes, and posteriorly, towards the promontory of the sacrum,—can be easily distinguished by the finger; while at the sides of the pelvis it is perfectly soft, flaccid, and distensible, and quite out of the reach of a common examination. The rule which I have been in the habit of following in my own practice is, that if one-third of the os uteri can be felt *continuously*, it is most likely in a state that will not admit the safe action of the instrument. Nevertheless I have, on no few occasions, delivered my patient satisfactorily with this instrument, when I could trace the os uteri all around; but it has then been perfectly pliant, and yielding.

Cases in which serviceable.—The cases in which the long forceps is so particularly serviceable, are, where the head has partly engaged in the pelvic brim, having descended too low to be raised for the introduction of the hand into the uterus, and the performance of the operation of turning, while at the same time it has not entered the cavity sufficiently for us to feel an ear, and where delivery has become necessary either in consequence of hæmorrhage, convulsions, syncope, or some other accidental cause;—the os uteri being at the same time perfectly dilated, or most easily dilatable. But it is *especially* useful in those instances where the pelvis is slightly contracted in its conjugate diameter, measuring between the pubes and the sacrum but a little more than three inches;—where the principal bulk of the head remains above the brim,—the uterine energies being strongly exerted, perhaps, but not powerful enough to squeeze the fœtal skull through the diminished aperture;—in which either exhaustion is approaching, or there exists a well-grounded fear that the uterus may injure itself by the violence of its own expulsive efforts. In such a case, provided the os uteri is completely, or almost fully opened, with the vagina and perineum sufficiently distensible, delivery may often be accomplished by the long forceps,—and thus the horrifying operation, entailing the destruction of the child's life, may be rendered unnecessary.

Mode of application.—The mode of applying the instrument differs exceedingly from that adopted when the short forceps is used. We do not apply it in relation to the situation of the child's head, but to the points of the pelvis. I have already mentioned that we adapt the short forceps decidedly in relation to the situation of the head, because we introduce each blade over an ear; but, in using the longer instrument, we apply a blade within each ilium. The woman, then, lying on her left side, the one blade will be above, the other below: and whether the child's face be directed towards the right or the left side, one is placed over the forehead, and the other over the occiput; or rather the blades are found to be applied somewhat diagonally, one reaching to the upper part of the orbit,—just to the superciliary ridge,—and the other exactly opposite to it, on one side of the occiput.* (Plate 56.)

To M. de Leurie, a French physician of some eminence, we are indebted for having first suggested the propriety of adapting the blades to the forehead and occiput. In a small work on the Cæsarean section, and the application of the forceps when the head is detained above the pelvic brim, published in 1779, he strongly advises this method of proceeding.

Two objections against this mode were urged by Baudelocque; and the merits of the new suggestion canvassed neither very fairly nor very temperately. He objects, that if the blades "be placed at the sides of the pelvis," they must be applied over the face and occiput, and that there is consequently great danger to the infant's features;—and again, he argues that if pressure be used in that direction, the bulk of the head cannot be diminished in the lateral diameter, (where, indeed, such diminution is required,) but its width must actually be augmented; because "the head being compressed one way, it must be lengthened in the other."† With regard to the first of these observations, it is founded on an erroneous idea regarding the actual position and form of the fœtal head: he seems to have overlooked the very large proportion which the cranium, properly so called, bears to the face in the mature fœtus, and to have forgotten that under labour the chin is generally thrown forcibly upon the chest, the head therefore bent very much forwards, while the vertex becomes the most depending part: in consequence of which position, the forehead, and not the face, would principally bear the stress of pressure. Besides, even allowing that the blades were long enough to cover the face entirely, provided both are of the same dimensions, the point of that which is applied over the occiput would impinge on the neck of the child, and prevent the other passing up so high as to embrace the face; if otherwise, they could not be properly locked. Even in the most recent works, however, on obstetric science, we read of the injury likely to be done to the child's face by the forceps, used as I recommend them; and by some authors* we are instructed that the blade applied *over the face* should be softly padded, as a protection to the features. I have employed this instrument on very numerous occasions, and I never, to my recollection, bruised a single feature. The point of the instrument, indeed, does not ascend further than the eyebrow, or (if the head be transversely placed, instead of diagonally) than the root of the nose.

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* The first recommendation which Smellie gave was, that the blades, like those of the common instrument, should be adapted over the ears—one lying behind the pubes, and the other anterior to the sacral promontory; and in this recommendation he has been followed by Burns, (fifth edition, p. 441,) Baudelocque, (parag. 1806, Heath's translation,) Dewees, (System of Midwifery, p. 324,) and other practitioners of repute; though both the latter-named authors prefer turning, if practicable, to the use of the long forceps. But he advises, also, "if the operator finds the upper part of the sacrum jutting in so much that the point of the forceps cannot pass it, let him try with his hand to turn the forehead a little backwards, so that one ear will be towards the groin, and the other towards the side of that prominence; consequently there will be more room for the blades to pass along the ears; but if the forehead should remain immoveable, or, though moved, return to its former place, let one blade be introduced *behind* one ear, and its fellow *before* the other."—(Treatise on Midwifery, vol. i. p. 238.) This quotation from Smellie embodies the opinion and practice of his followers, and proves how intimately versed that great physician was with the difficulties sometimes met with in obstetric surgery. The truth is, that in by far the greater number of cases under which the long forceps becomes necessary and useful, it is impossible to apply the blades over the ears, in consequence of this very impediment which Smellie has pointed out; the extremity of that blade which is introduced backwards impinges on the promontory of the sacrum, and neither force nor address will overcome the resistance offered to its progress upwards. When the pelvis is well formed, indeed, and the necessity for having recourse to the long forceps originates in any of the accidental causes above named, it may be very possible, and even easy, to apply them as Smellie, Baudelocque, Burns, and Dewees advise; but under a diminution of space in the conjugate diameter at the brim, this is very seldom practicable.

† Parag. 1804, translation.

The second objection is not more difficult to dispose of than the first, for it is also founded on a false assumption. There is no question that the fœtal head cannot be decreased in one diameter without being lengthened in another; but it does not necessarily follow that under the application of the long forceps, the increased diameter should be from one parietal bone to the opposite. It will be found, indeed, in practice, that the increase principally—if not entirely—takes place in the direction from the chin to the vertex; and that the cranium is moulded into a still longer or more conical form. Now, as this particular change in the figure of the head does not in the least interfere with its passage through the pelvis, the only consideration which presses itself on the mind is, whether it is likely to endanger the child's life; and I believe, that the fœtus will not bear, with impunity, the same degree of pressure when the compressing powers are adapted over the forehead and occiput, as when applied laterally. This requires further confirmation, and is a subject well worthy the consideration of practical men.†

I will take, then, the case most frequently met with in illustration, and suppose the patient possesses a slightly contracted pelvis. I will presume that the parts are tolerably well relaxed; that the os uteri is dilated, being not discoverable at the sides, but pinched anteriorly between the head of the child and the pelvic bones, tender and slightly swollen; that a large portion of the head has come into the pelvis in an elongated, conical shape, but that the base remains above the brim; that eighteen or twenty-four hours have elapsed since the rupture of the membranes; that the pains, which have been exceedingly strong, are beginning to flag, and that other symptoms of exhaustion are appearing:—or perhaps that they still continue powerful, but that there has supervened a violent local pain at one particular part of the uterus, constant and uninterrupted; so that we have reason to fear injury to its structure may occur, unless delivery be speedily accomplished: under such a state, if the pelvis contains more than three clear inches in the conjugate diameter, and is not diminished in space laterally, we are warranted in having recourse to the long forceps, and the operation must be conducted in the following manner.

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* Campbell's Midwifery, p. 242.

† See Radford's Second Essay in Midwifery, p. 10, for the same opinion; and for arguments to support it. See also the review of the first edition of this work, in the British and Foreign Medical Review, (October, 1841, p. 485,) which I have good reason to believe is by the pen of a learned professor of obstetrics, in a celebrated northern university. It is there stated particularly that this instrument "is more dangerous to the child, not from the *degree* of pressure, but from its *direction* being in the antero-posterior axis of the head."

The woman being placed on her left side, with the nates near the edge of the bed,—the bladder having been evacuated by the catheter, and the rectum emptied also, if necessary,—we warm and grease both blades of the instrument, and pass two fingers of the left hand under the right ilium, as high as possible upon the child's head; then, taking lightly in our right hand that blade whose convex edge is towards our left side when the back of the instrument is next our person,* we incline the handle up towards the pubes, and introduce the point backwards along the sacrum, keeping it in close proximity to the head, and insinuating it with the same semi-rotatory, wriggling movement before directed. When the blade is so far passed up that the point approaches near to the sacral promontory, the handle must be gently drawn backwards towards the anus, and at the same time somewhat depressed; the point will then slide up under our fingers, and the whole blade will lie flat upon the fœtal skull within the right ilium. Or, to avoid the necessity of the blade making a circuit of any part of the pelvis, the handle may be depressed below the bed-furniture, and the point at once slipped up within the ilium, between our fingers and the head. This, however, requires that the nates of the patient should project considerably over the bed's edge—a posture difficult to obtain and to preserve—else the handle cannot be sufficiently lowered: and since the cavity of the sacrum is not occupied by the head, in the case under consideration, in the same manner as it is when the short forceps is applicable, there is not the same difficulty in making this partially circular sweep, nor the same chance of injury attending the change in the position of the instrument. When the first blade is properly adapted, it must be retained in its situation by our own little finger and thumb, or by an assistant, and the second must be introduced within the left ilium,—guided by the two first fingers of our left hand,—exactly in the same manner as the first, until its locking part slips into that of the uppermost blade. If, when they are both fully introduced, it is observed that the blades are not perfect antagonists to each other, and consequently that they do not lock easily, no twisting must be used to make one groove fit into the other—no wrenching or screwing round; for it must be recollected that the points are actually received within the uterus, and that the neck and mouth of the womb may be seriously injured by our incautious efforts;—we may, indeed, do infinitely more mischief even, than if we employ the same force while adapting the short forceps; but we must withdraw the second blade, and pass it up again in a different and more suitable direction. No effort at extraction must be made until the lock is firmly fixed. The head, then, being included within the two blades, the same cautions must be attended to as in the case of the short forceps. A finger must be carried quite around the lock, to ascertain that none of the mother's structures are trapped; moderate pressure is to be applied by our hands; and extraction must be begun.*

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* See the second figure of the wood-cut.

We are sometimes told, that we must never think of having recourse to the long forceps until we have ascertained with certainty to which side of the pelvis the child's face inclines; but this information, however desirable it may be, it is not always possible to gain, even in cases perfectly adapted to the instrument; for the head is usually so high that an ear cannot be felt without passing the hand into the pelvis, and carrying one or more fingers into the uterine cavity—a measure which would produce both much pain and some danger: while, on the other hand, from the puffy state of the scalp, the fontanelle and limbs of the lambdoidal suture can scarcely ever be distinguished; so that,—although in the earlier part of the process we might have been able accurately to satisfy ourselves as to the position of the head,—when called to a case requiring the assistance of the long forceps, that knowledge is obtained with great difficulty. And fortunately it is not absolutely necessary, for the success of our operation, that we should positively learn to which side the face is directed; for when the impediment at the brim is overcome, the head will generally of its own accord turn, with the face towards the hollow of the sacrum, without the use of any directing power on our part;

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* I have almost invariably found that the facility with which extraction can be accomplished will be, in a great degree, indicated by the ease or difficulty experienced in locking the blades. If the blades are fitted together without much trouble, the after part of the operation—that of extraction—is comparatively easy; but if there is great difficulty in adapting them after their introduction, extraction by them will be proportionably difficult, and perhaps impracticable.

so that we have only to *follow* it in its natural inclination, without attempting to *guide* it.*

In making extraction, the same pendulum-like motion must be used which avails us with the shorter instrument. It must not consist of a rapid succession of short, hasty, jerking movements, nor a strenuous and forcible swing, but of a full, slow, regular sweep from handle to handle, the lock being kept back towards the perineum as closely as is consistent with its safety, while slight traction is exerted downwards.

As soon as the head has passed the contracted brim, and has become fully lodged in the pelvic cavity, we usually find that the principal difficulty has vanished; and it then becomes a question in what way the labour should be terminated—whether we should finish it with the instruments, as first applied,—whether we should take them off, and leave the case to be completed by the natural powers,—or whether, on their removal, we should apply a short pair over the ears, and act according to the rules previously laid down:—and I think these questions can be satisfactorily answered; for each mode possesses its own advantages, according to the peculiar features of every case. If, then, the uterus be acting but feebly, either from exhaustion or any other cause, while at the same time the outlet of the pelvis is of the ordinary capacity, and the vagina and external parts are relaxed, we may terminate the labour at once by continuing to extract with these instruments, without changing their position, because there is little risk of injury; and if the remainder of the case were left to nature, much time might unprofitably glide by, before its completion. If, on the contrary, the pains are still strong, while the external parts continue rigid, the outlet of the pelvis being well formed, it would be better to remove the instruments, and to trust the conclusion of the labour to nature's unaided efforts. But should the inferior aperture partake of the distortion, whether rigidity of the soft parts exist or not, we might then, on the withdrawal of the instrument, apply the short forceps over the ears, and cautiously and tenderly terminate the case through their agency: and I give this latter recommendation because of the probability that nature will not herself complete the delivery, and because the short forceps are much less likely to bruise or lacerate, being applied over the side of the head, than the long, which are adapted to the occiput and brow.

Cautions.—There are some cautions necessary in the use of the

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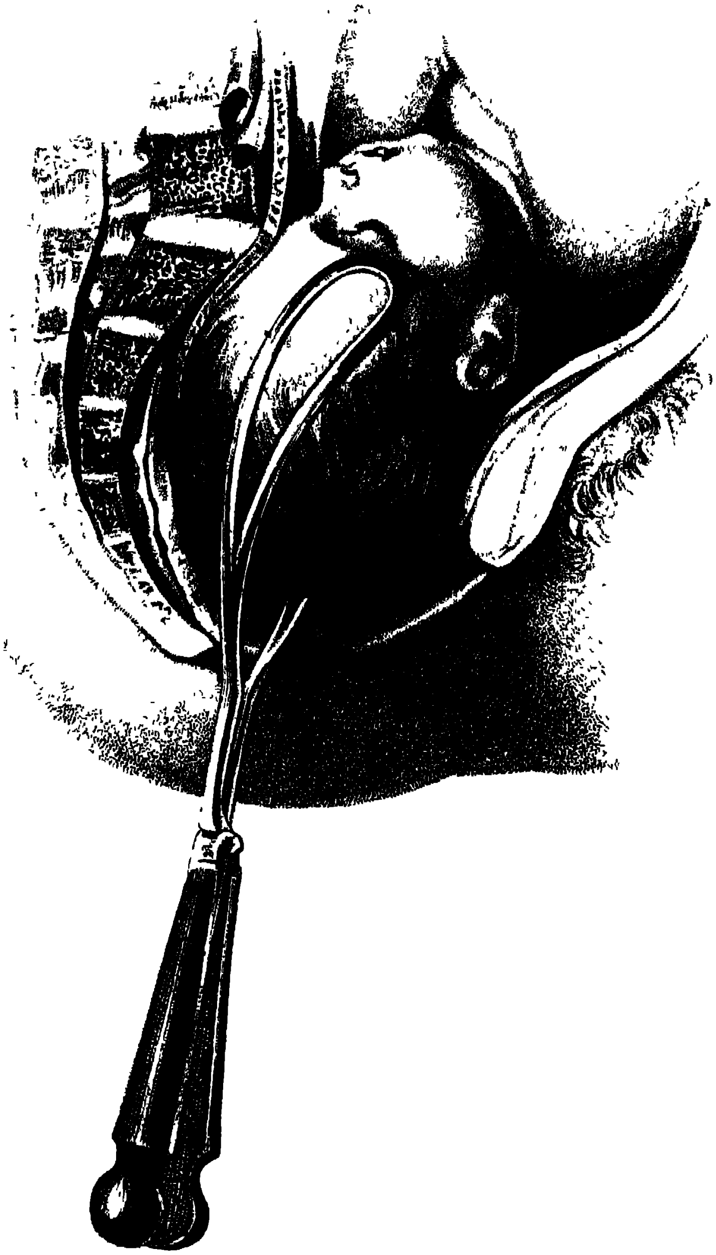
* In plate 56, the long forceps is represented as applied when the principal bulk of the head is above the brim of the pelvis, the face being situated towards the right sacro-iliac synchondrosis; one blade is adapted over the right brow, and the other over the left side of the occiput. The head is pictured as very much elongated, consequent on the pressure it has suffered.



long forceps, from which the shorter kind are exempt. They principally are, *First*—That we should not apply them in a case where great distortion exists. It has been already laid down as a general principle, more than once, that, unless the pelvis possess, in its conjugate diameter, three inches of clear available space, we cannot expect a full-grown, well-ossified head to pass entire; and through such a diminished aperture we are not to hope that we shall be able to extract it by the forceps. Burns,* indeed, fixes the limit of the deformity which would indicate the use of the long forceps at that space. Davis,† from the observations he has left, would lead us to believe that rather more was required than that which Burns specifies; and I am inclined to think that, unless the pelvis measures at least three inches and a quarter, we shall generally be foiled in our attempts at delivery; or, at least, be disappointed in our hope of extracting the child living.

Secondly—In introducing each blade, we must be particularly careful that the point slides within the os uteri, and does not run up between the vagina and the neck of the womb, lest we should bruise or lacerate that organ at its junction with the vagina; and especially, lest, in attempting to lock the blades, we should pinch its structure between their extremities and the child's head. This mischance cannot happen with the short forceps, because the os uteri must be entirely dilated before their application; and, when the longer pair is used, it may be avoided by taking care that the point is constantly kept in contact with the fœtal cranium, guided by two fingers previously passed up.

Thirdly—That we should not employ any strenuous endeavours for effecting delivery, nor work with the instrument for too long a period continuously. The longer the blades the greater leverage we possess; and it must be evident that each increase of leverage augments our power: we are not only, therefore, liable to use too much exertion; but we run the risk of making pressure upon structures less capable of sustaining it uninjured, than when we employ the short forceps. Unless, then, a decided advance be evident after a few minutes' well-directed efforts, we should desist from renewing our attempts; and we must judge of the progress we are making, by examining after each backward and forward movement of the instrument. We must most scrupulously avoid using *forcible* means. *Force*, indeed, is a word which should be expunged from the vocabulary of obstetrical phrases.

Fourthly—We must be guarded in our promises in respect to terminating the labour by the means we are about to use;

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* Op. cit. p. 440.

† Operat. Mid. p. 230.

because it is impossible that we can measure the head accurately while its base remains above the brim, and it is equally impossible that we should be able to form an opinion of the degree of ossification it has acquired, and of its compressibility. In all these points we may be deceived, although we may have made ourselves acquainted with the capacity of the pelvis to the greatest nicety; and while such chances of deception exist, we must be most cautious not to add disappointment to suffering. I have myself, in some instances, been foiled in attempting to extract the head entire through a narrowed aperture, even although the instrument embraced it perfectly, and have been obliged, eventually, to resort to the perforator. I always feel more satisfied, however, in lessening the head after having made these attempts, because I have good reason to think that nature unassisted would seldom be able to expel a child through a pelvis of such small dimensions, as would not admit its passage by the aid of the long forceps;—provided, in other respects, the case was fitted for the employment of that instrument. I would advise the operator, then, before proceeding to act, not to make a promise of delivery, but merely to state that he is about to do something which will most probably relieve the patient materially, and that, *perhaps*, he may at once terminate the labour.

After all I have said on this subject, I must not close my remarks without coinciding in opinion with Professor Davis, that the instrument, although very powerful and valuable, is at the same time dangerous in its use; that it should not be taken in hand except by those who have acquired some proficiency in obstetric operations; and that it is to be had recourse to more as an experimental measure for superseding the necessity of destroying the child, than as one of the common resources of our art.*

CRANIOTOMY.

Of all instrumental operations in obstetric surgery, the perforation of the skull, and extraction of the mutilated fœtus, is the easiest which could be undertaken for delivery in any case of impacted head; and much do I fear, that to the facility with which this operation can be accomplished, have been sacrificed the lives of many children.†

It may, perhaps, be desirable in surgery, whenever necessity compels us to perform an apparently cruel operation, that the horror which the simple and bare mention of that act would inspire might be smothered and absorbed, as it were, by the sonorous and classical title which it bears; but by whatever name it is called,—under whatever high-sounding appellation it is disguised,—we cannot alter or conceal the fact, that the operation consists in plunging an iron instrument into the centre of the skull of a human being, perhaps at that moment living, and extracting it after this mutilation has been practised.*

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* Obstetric Medicine, pp. 1132 and 1139.

† This operation has been described under various terms — embryulcia and embryousia, which have been by different authorities derived from εμβρυον and ελκω, *traho*—or ελαω, *abigo*—or θλαω, *frango;* embryotomy, from εμβρυον, *fœtus;* kephalotomy, from κεφαλη, *caput;* and craniotomy, from κρανιον, *calvaria*, and τεμνω, *seco.* The latter term is, I think, in most common use, and is the one which I shall adopt.

Some, indeed, horrified at this arbitrary destruction of fœtal existence, have laudably contended that the proceeding is not justified unless the child be dead: they argue, and with truth, that human life is held at the will of one Supreme Being alone, —and that, unless forfeited to the laws, to no human hand is delegated the power of destroying it. Strong and valid would these objections be, if once the operation were performed wantonly, or without grave and deep consideration; but it is never had recourse to except for the purpose of saving life, or preventing future misery. Did the mother perish, the fœtus within her must perish likewise; and in this country, we consider the mother's life as paramount;—nay, more, we think ourselves warranted in sacrificing the infant, if that be the only way to preserve her person from those dreadful lesions of sloughing and laceration, which, if they took place, must—though they did not terminate in death—render her future existence a scene of uninterrupted wretchedness.

Nor are there wanting arguments sufficiently strong and numerous to justify our practice. These are, perhaps, more the province of the philanthropist or medical jurist, than the practical surgeon: but I may remark that the mother is bound to the world by many social, moral, and religious ties; she has shared the enjoyments, as well as the cares of life; she has her feelings and affections, her fears and her hopes; she is dependent on others, and others are dependent on her: when she dies, there is left a blank, which, to some surviving, never can be filled. Not so, however, with the unborn infant. Although, in dying, some personal pain may be experienced, yet the agony of mind it cannot suffer: it has no affections; no dependents; its existence centres almost exclusively in itself;—except to its nearest relatives, then, its death cannot be greatly felt. And, notwithstanding we cannot estimate life relatively, as we can any other possession,—

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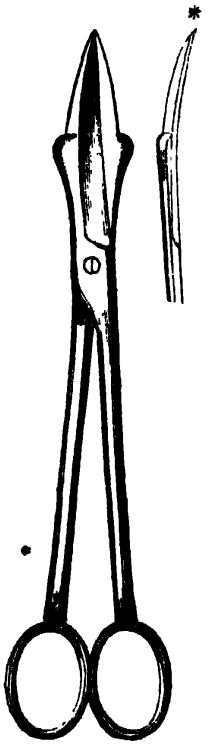
* In the whole range of surgery, this is the only operation recognised and sanctioned by the British Profession, which is undertaken with the *avowed intention of destroying life;* if we except those very rare cases where early abortion may be determined upon, either in consequence of there being too small a pelvis to permit the passage of a child sufficiently perfected in utero to sustain an independent existence; or of some irritation dependent on pregnancy, which brings the woman's life into present, imminent jeopardy.

since, with our limited comprehensions, death is shrunk from as the worst evil that can befal humanity,—yet we are surely justified, in a political, if not in a moral point of view, in preferring the preservation of the strong to the weak, the healthy to the diseased, and the mother of a family to the unborn fœtus, provided one or other must in all probability be sacrificed. From these considerations, we prefer, whenever we have a choice, the mother's safety to the infant's life; yet I would entreat the young surgeon, in the strongest terms, to think long and much—carefully, deliberately, and dispassionately—before he has recourse to so dreadful an expedient as is offered by craniotomy.*

Instruments employed.—Few and simple are the means required for this dire, this terrible, this destructive and heart-rending operation; the perforator or the scissors, the blunt hook of different sizes, the crotchet or sharp hook, the craniotomy forceps, and perhaps the osteotomist, and bone forceps, are all the implements necessary. Our instruments, therefore, may be divided into two kinds,—the one to perforate the skull, and the other to extract after the necessary diminution in bulk is effected.



A front view of Smellie's Scissors, and *side view of the point.

Perforator.—Denman's perforator is about twelve inches in length: it has a sharp point, and two sharp external edges, from the point to the shoulder or rest; but the internal surface is blunt; it opens with a joint like a pair of scissors, and has a rest about an inch from the extremity, to prevent its penetrating beyond a certain distance into the skull. I prefer Smellie's scissors, nearly of the same dimensions, having a cutting edge both externally and within, because they are useful also for perforating the chest in cases of impacted transverse presentations, as well as for the operation of craniotomy. In choosing a perforator, we should be particular about its length; that it is made sufficiently strong not to bend under use; that the shank of the blades should not fit close at their junction, lest they should pinch the vagina when shut; that there should be no sharp edge about the joint, but that the limbs should be in every part smoothed round, and that the point should be slightly curved.[*]

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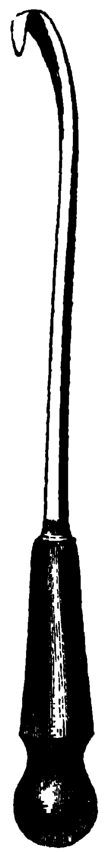
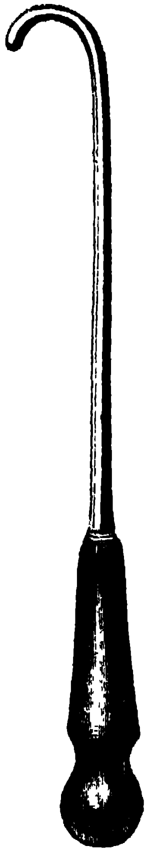
* Most of the Continental, and some of the American, practitioners, even now contend that craniotomy never should be performed unless there are positive indications present of the child's death. Thus, Velpeau—"L'embryotomie n'est plus admise, que dans le cas où tout annonce que le fœtus est mort, ou ne peut vivre."—(Edit. Brux. p. 444.) And Dugés says—"Le crotchet aigu ne peut être appliqué que sur un enfant indubitablement mort. Cette operation ne convient que quand on a la certitude de la mort de l'enfant."—(Manuel d'Accouch., 1840, pp. 276—278.) Baudelocque, too, has this passage, in speaking of craniotomy—"Rien ne sauroit excuser

Crotchet.—The crotchet, or sharp hook, is for the purpose of



Crotchet.



Blunt hook.

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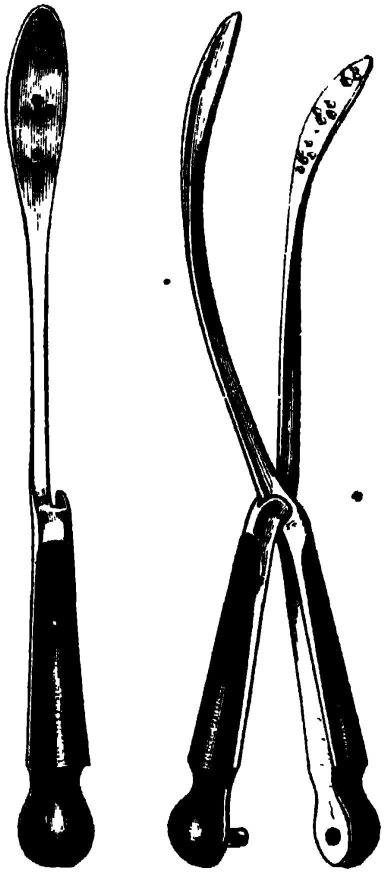
le practicien, qui se comporteroit ainsi, sans avoir auparavant la certitude de la mort de l'enfant."—(Parag. 1998.) These sentiments are adopted by the German and Italian physicians; but they are diametrically opposed to British practice. They perfectly coincide, however, with the feeling expressed in the answer of the doctors of the Sorbonne, in 1688, to the question, Whether it was lawful to destroy the child for the purpose of saving the mother: "Nous sommes d'avis que si l'on ne peut tirer l'enfant sans le tuer, l'on ne peut sans péché mortel le tirer:" for which they quote, as their authority, the barbarous maxim of St. Ambrose—"Si alteri subvenire non potest nisi alter lædatur, commodius est neutrum juvare." (See Daventer, Paris, 4to. 1734, p. 366.) In 1755, however, the same tribunal ruled that it was lawful to baptize children in utero by means of injection; thus removing one of the objections to craniotomy in force in Roman Catholic countries: viz., that the child would necessarily perish eternally, unless that rite had been administered, but leaving the main question undecided. (See Astruc. Trans. 1767, p. 217.)

[*] Dr. Wallace Johnson added this curve to the extremity of the perforator: it does not increase the value of the instrument, as far as making the incision is concerned,—its only object is the preservation of our own fingers from injury; for, as the instrument is guided up to its destination along the groove between two of the fingers, if the point were quite straight we should run the risk of lacerating them; and as this form by no means detracts from its usefulness, it is as well to adopt it.

extracting the child's head after it has been opened, and is formed in the shape of a beak. The point should not be very sharp, lest it tear too easily through the bones, and injure the woman's structures, or run into our own fingers; nor too blunt, lest it should not retain its hold. Simple as this instrument appears, it is one of the most difficult of all our obstetric appliances to procure good; for the least variation in the sharpness of its extremity makes a considerable difference in its value.

Blunt hook.—It is desirable that we should be furnished with two or three blunt hooks, of different sizes: they are also used as extractive powers, and may sometimes supersede the necessity of the crotchet, or be employed instead of that instrument, if the bones of the skull are too much loosened by putrefaction from their membranous attachments to afford a purchase to the crotchet: in such a case, the extremity of the hook may perhaps be fixed in the foramen magnum, or behind an orbit.

Craniotomy forceps.—Another extracting instrument, much in use in the present day, is the craniotomy forceps. This is formed of two separate blades, which are joined, after their application, by



Craniotomy Forceps; the first cut represents the cup-blade, with indentations to receive the teeth of the other; the second, the entire instrument.

a double groove similar to that of the forceps: one of them passes within the skull, and, being furnished with teeth, perforates the bone; while the other is introduced externally to the cranium, and possesses indentations or cavities, into which the teeth of the first blade are received. When properly fixed, the extremities of the handles are to be bound firmly together by a ligature, and steady traction applied: if the bones are very strong, and the diminution of space but small, this instrument is most powerful and highly useful; but if the bones are weak, and easily give way, it is a more dangerous instrument even than the common crotchet; for, while the crotchet is fixed within the skull, the finger is applied exactly opposite to it externally (Plate 58); and if the point perforates the bone, or slips away from its attachment, it cannot injure the os uteri or vagina, as it must necessarily come against our finger. But when the craniotomy forceps are employed (Plate 59*), it is not possible to guard the structures from laceration in the same manner: their teeth are certainly well sheathed by the antagonistic blade; but, in consequence of the perforations which they make in the bone, its structure is so weakened that it easily gives way; the instrument then breaks suddenly out, bringing with it a portion of the skull, and perhaps some of the scalp also. This accident would indeed be of little consequence, no other inconvenience being suffered than the loss of the purchase,—if the whole of the bone that comes away was always either covered by the scalp, or sheathed by the instrument itself: but this I have found by no means the case; for the irregular, jagged edges of the separated piece of the broken bone project beyond the margin of the blades, and—in its rapid passage through the vagina, as the instrument tears itself away—they are very likely to lacerate that organ, as well as the external parts. For these reasons I prefer employing the crotchet, although I always carry with me the craniotomy forceps as well.†

Osteotomist.—This instrument is intended to break up the bones of the child's head, particularly at the base of the skull, so as to enable the operator to extract the fœtus through a very narrow pelvis, and thus to supersede the necessity of having recourse to the Cæsarean operation.

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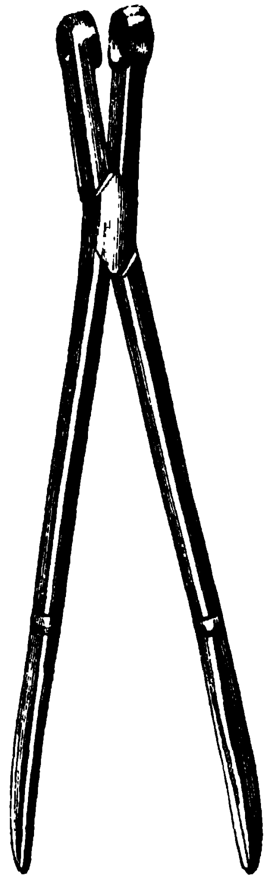
* To give a full view of the pelvic cavity, the right hand only is introduced into the drawing, embracing the handle of the instrument; in practice, however, two fingers of the left hand should be kept in contact with the fœtal head, during extraction, to watch the descent, and afford a degree of steadiness to the operator.

† Mr. Holmes has improved the craniotomy forceps by making the teeth in the form of the teeth of a rabbit; but his instrument has a fixed joint, and it appears to me not so capable of easy application as when the two blades are introduced separately, and united by a joint such as is possessed by the common English forceps. Dr. Lee holds the same opinion with regard to the craniotomy forceps as I do myself:—"I am convinced that the crotchet is the only instrument that can be used

It cannot be requisite to give a delineation of the *bone forceps;* for any common pair of hinged surgical forceps, provided they are strong enough, will serve the purpose of removing the portions of bone, broken from the skull by the crotchet, or the craniotomy forceps.



Davis's Osteotomist.

Cases in which Craniotomy is required.—I need scarcely repeat, that although on some occasions we may feel justified in having recourse to harmless means for the purpose of delivery, before exhaustion has proceeded to any great extent, we are never warranted in taking the perforator in hand, unless driven to it by a dreadful necessity; — provided, indeed, there is any doubt as to the child's being still alive.

Many accidental causes may occasionally oblige us to resort to craniotomy—such as hæmorrhage, convulsions, rupture of the uterus, syncope, and other anomalous states, immediately and seriously threatening the mother's existence; but we never adopt this method while the child is living, if a safe delivery be practicable by any other. It is, however, by far most usually found necessary where disproportion obtains between the head and the pelvic bones; and if any diminution in the capacity of the pelvis exists, that is generally observed at the brim, in the conjugate diameter,—as has been more than once remarked. I have, in a previous part of this work, endeavoured to lay down a practical rule on this interesting subject, founded on actual measurement of the pelvis;* and to draw a distinctive line between those cases in which it is possible for the head of a full-grown, mature, and well-ossified fœtus, to be extracted whole, and those others where a diminution in bulk by mutilation must be practised before the birth can take place; and as a principle, we regard a pelvis possessing less space than three inches in the conjugate diameter, unequal to the transmission of the skull entire. Nevertheless, it behoves us, even under such a diminished capacity, to wait as long as is at all consistent with the woman's safety, before we employ such deadly means.

It is by no means necessary for the success of the operation

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effectively to extract the head under parturition, when the pelvis is greatly distorted." Med. Gaz. Nov. 26, 1841, p. 347.

* Page 24.

that the os uteri should be entirely dilated;—the wider, indeed, the orifice is opened, the less chance will there be of injuring that organ; but should it not have acquired a diameter greater than that of half-a-crown, we do not, on that account, shrink from its performance. In many cases I have been compelled to deliver by these instruments when the mouth of the womb was not only undilated, but still possessed of considerable rigidity.

Mode of performing the operation.—After the perfect evacuation of the bladder and rectum,—the patient lying in the usual obstetric position, and two or three folds of napkins being placed under her, to receive the portions of cerebral matter as they escape,—two fingers of the left hand must be carried into the pelvis, and their tips brought steadily to bear against the most depending part of the fœtal skull. The perforator, having been previously warmed and greased, must then be directed along the groove between the fingers, until its extremity comes in contact with the head; a rapid semi-rotatory or boring motion must be given to the instrument, and it will soon be felt to perforate the bone, and enter the skull itself; and it must be pressed onwards until the studs prevent its passing any further. The fingers must then be separated, and their inner edges placed against the rests of the instrument. The eye at the extremity of the lower limb must be held firmly by the finger and thumb of our right hand, while an assistant is required to open the blades, by raising the upper limb to the extent of three inches. (Plate 57.)* By this separation of the handles a laceration of more than an inch in length will be made in the fœtal skull. Provided the rests be well protected, there is little likelihood of any injury happening to the maternal structures; because all the cutting portion of the perforator is sheathed within the head itself. The instrument must afterwards be half turned round, without being withdrawn, and the edges directed respectively towards the sacrum and pubes; the handles must then again be separated in exactly the same manner, so that a crucial aperture may be formed in the bones. The projecting stops require now to be covered by the fingers with even greater diligence than before; for, independently of the space between the pubes and sacrum being so much less than the lateral diameter, there is greater danger of wounding the os uteri, the rectum, and particularly the bladder, while this second incision is being made. An aperture sufficiently large being obtained to admit the instrument more completely within the cranium, it must be introduced beyond the rests, and turned rapidly round in every direction, that the cerebral mass may be broken down as completely and speedily as possible. In this stage of the operation we shall find the scissors more efficient than Denman's perforator; because, by opening and shutting them, we can more perfectly destroy the organization of the brain, tear the vessels, perforate the tentorium, and even reduce the cerebellum into fragments.

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* Naegelé's and Holmes' perforators are so formed that, by closing the handles, the points are separated, and the object of the invention is to prevent the necessity of having an assistant; one hand only being required to enlarge the aperture, while the other protects the rests. In remote situations of the country, it may be desirable to possess this instrument; but in towns and populous districts, it cannot be so requisite, because assistance is always at hand, and the amount of help we want may be afforded even by a nurse.

It is of much moment that the structures at the base of the brain should be broken up, if possible—for organic life seems mainly dependent on their integrity; and, if the fœtus does not die from loss of blood, the nerves may preserve their vitality, and perform their functions, although the principal part of the cerebrum be reduced to the consistence of pulp, or be even evacuated. Instances have been known of the child breathing and crying loudly on its birth, after the head had been opened, and the brain partially extracted,*—than which no accidental mischance, in the performance of any operation whatever, I should imagine, could produce so lively a thrill of horror.

A sufficiently large aperture being formed in the bone, the second part of the operation—extraction—must be commenced. This may be effected either with the craniotomy forceps or the crotchet; but, for reasons previously given, I prefer the latter instrument,—for I have found that, if employed with due caution, it is less dangerous than the craniotomy forceps, and, if a firm hold be obtained, almost equally powerful. The crotchet, then, being introduced within the skull, must be fixed on the internal surface of the bone, wherever there is sufficient resistance to afford the necessary purchase: a finger of the left hand must be kept *close upon the head externally*, exactly opposite the spot on which the extremity of the instrument is fixed within: by this means its sharp point is perfectly covered, and should it even break through the bone, or slip from its hold, the finger will receive it, and all chance of tearing the maternal structures be thus prevented. Extraction must be attempted by a steady power downwards, applied in the direction of the axis of the

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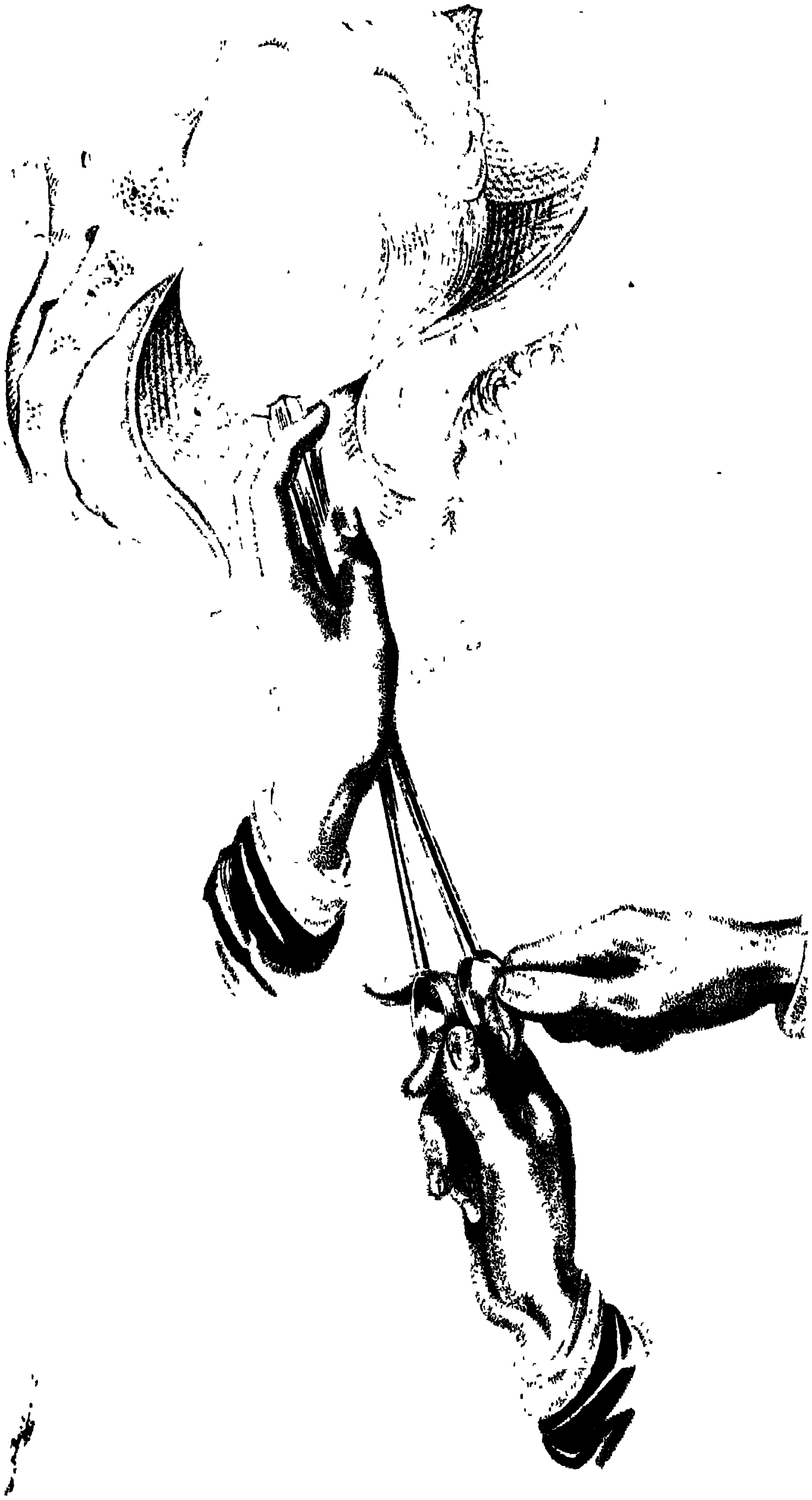
* See Med. Chirurg. Review, January, 1834, p. 204. Also, Saviard's Observations on Surgery, 1740, p. 183. A case of very distressing character is reported in the Med. Chirurg. Trans., vol. xii. p. 308, in which a child lived for forty-six hours after its extraction, although "the cerebrum was completely broken down, and about two ounces of brain were taken out." It cried frequently and loudly, passed fæces and urine; and for twelve hours the functions of life seemed to be carried on in the usual healthy manner. On examining the brain after death, both hemispheres were completely torn and destroyed; but the cerebellum and medulla oblongata were not injured.

PLATE [illegible]



pelvic brim, which is in a line from the umbilicus to the coccyx.

If any jerking movement be resorted to, the bone will certainly be broken, and the purchase lost. It is most probable, but not desirable, that after the continuance of exertion for some time in the same position, the point of the crotchet will perforate the bone, and be felt naked by our finger (Plate 58); it will then be of little avail to continue our extractive efforts, without changing the situation of the instrument, because that portion on which it has been fixed will soon separate, and it will consequently tear itself away,—but a fresh purchase must at once be sought at some other part of the skull, and the same steady efforts used to overcome the difficulty.

If the pelvis be considerably contracted, we may expect that much exertion will be necessary, and much time will be spent, before the head passes through the brim; and we must not be disappointed in finding the bones break constantly, and piece after piece come away. The loosened pieces must be carefully removed, either by the fingers or a pair of small forceps contrived for the purpose, and the naked edges, still remaining within the vagina, studiously covered by the scalp. In this manner the parietal, the greatest portion of the frontal, and parts of the occipital bones, may be brought away; and the orbits, or the foramen magnum, will then afford a strong and most valuable hold either to the crotchet or blunt hook. Should the blunt hook slip, as it will often do, or the crotchet too easily destroy the texture of the bones, recourse may be had to the craniotomy forceps, the greatest care being taken not to inclose any portion of the os uteri between the blades; and the other dangers to which I have before adverted being borne in mind.

Another great objection to the craniotomy forceps consists in the difficulty of their re-adjustment, when they have broken from their previous hold; for it is not always easy to find a fresh purchase on which they can be applied without injury. The guarded crotchet of Davis will sometimes, perhaps, be useful; but I cannot help thinking the best security the patient can experience is in our own caution, and the best guard we can employ, our own finger.*

It is recommended by some practitioners, that we should endeavour to break up the cranial bones on all occasions where this operation has become necessary, and take them away separately, as soon as we can accomplish it. With these instructions

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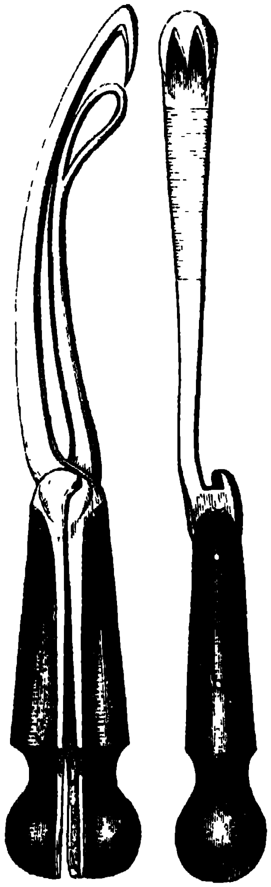
* It happened to me, on two occasions, to destroy the skull so entirely, that both the orbits and the foramen magnum had given way, and nothing was left which would afford a hold to any of my instruments. In these cases I delivered eventually by turning, not without subjecting the patient to considerable hazard.

I cannot coincide; because I have found that when they have readily parted from each other, in consequence of a high degree of putrefaction having taken place, the operation was both more difficult and more dangerous than when they possessed a firmer texture, and offered more resistance.



One form of Professor Davis's Guarded Crotchet. The first figure represents the instrument closed, the second the crotchet blade which is to be fixed on the *outer* part of the skull.

As the head collapses in its passage through the brim, the brain oozes out of the opening we have made, and the appearance of cerebral matter externally is almost a sure sign of the child's descent; it will be received on the napkins previously applied, which should be removed occasionally, and others substituted, attention being given that none of the pulpified mass be strewed over the bed furniture, or fall upon the floor.

There can be no necessity, in the generality of cases, for the introduction of a *spoon* within the cranium, or any other kind of scoop, for the purpose of extracting the brain; because, if that organ be broken down, and the membranous septa within the skull be divided, it will readily escape when our extractive effort is applied.

Some have advised that, after perforation was effected, many hours should be allowed to elapse before extraction was attempted, that time might be given for the bones to collapse; and that the diminished head might accommodate itself to the irregularities of the pelvic apertures.*

From this recommendation, also, in the generality of cases, I dissent, because, if we have delayed operating until symptoms threatening exhaustion have appeared, we cannot expect that the uterus will retain sufficient power to accomplish the delivery, or even to propel the head into the pelvic cavity:—besides, in so acting, we are lessening the chance of recovery to the patient, by adding to her present sufferings,

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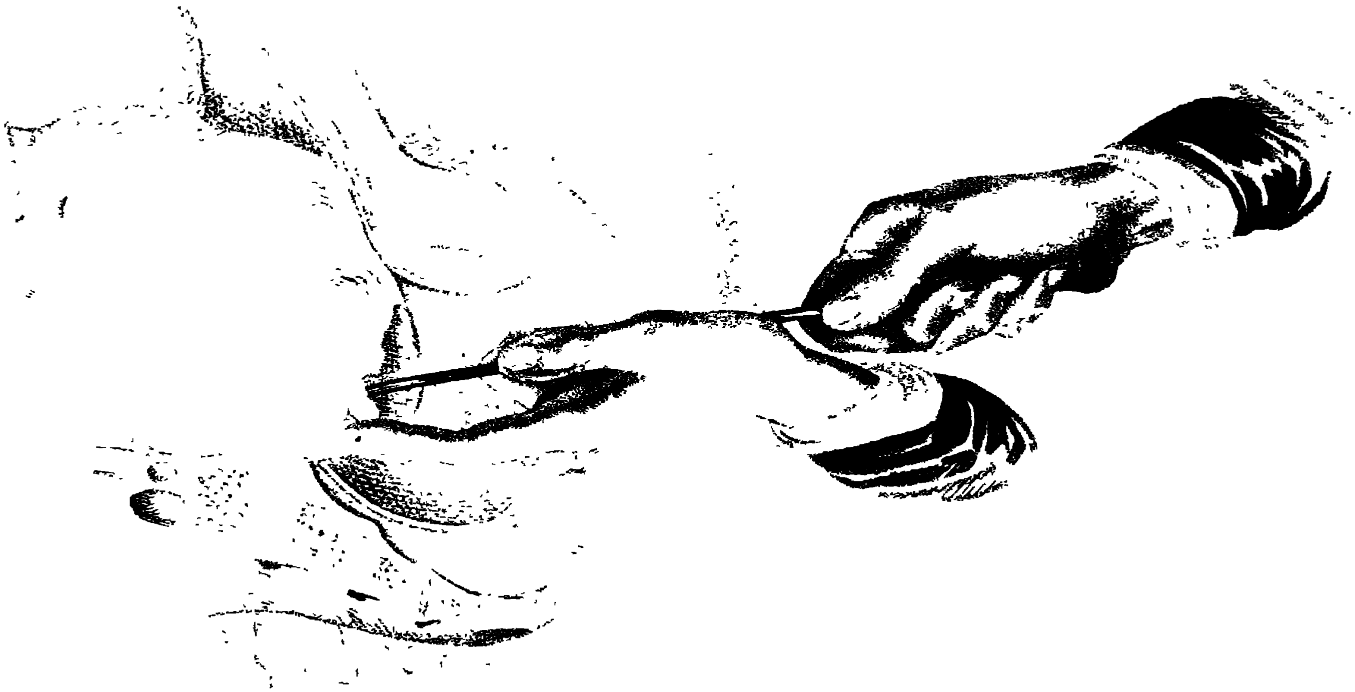
* Osborn's Essays on Midwifery, p. 233. He certainly limits this delay to cases where the head has been opened early in the labour; but he recommends that extreme measure to be resorted to "at the beginning of labour, whenever the capacity of the pelvis is only two inches and three quarters, or certainly less than three inches," in the conjugate diameter,—a practice which, for reasons before adduced, I consider most unjustifiable,—provided the space between the pubes and sacrum approaches near to three inches. Davis (p. 1159) thinks this may be done if there be not more than two inches and a half; and in this opinion I coincide.



and allowing her system to become hourly more depressed; we are at the same time rendering the operation more difficult, by losing the advantage of whatever energy may still remain to the uterus; and perhaps, also, by permitting putrefaction to take place; under which state the bones will be more or less loosened from their attachment to each other, and the purchase they ought to afford necessarily weakened. If, then, we subject our patient to such an increase of danger, and render the operation so much more difficult,—especially as we have inflicted the *summa injuria* upon the infant,—what advantage can we gain by delaying the completion of the delivery?

Such a proceeding may certainly be advisable in those more rare instances of extreme deformity, where not the slightest hope exists of the head being expelled whole, and in which early perforation is had recourse to, under the conviction of its absolute necessity. We may then, while the powers are strong and unimpaired, wait for a few hours with impunity, or probably even with benefit, as Osborn suggested; but, as a general principle, the practice is, in my opinion, to be deprecated.

By others,* again, we are recommended to seek for a suture or a fontanelle, and to perforate the head at one of those spaces, because the instrument more readily pierces the membrane than the bone. My custom is, to make the opening at the most depending part of the head,—that which is most readily touched,—because there is then less danger of injuring the os uteri—because the point of the perforator is sufficiently sharp to drill a hole through the bone itself—and because, if we carry it to one side, it is very likely not to enter the head at all, but to run up between the skull and the scalp, merely separating the one from the other.

On the head being born, it must be enveloped in a napkin; and it is most probable that a continuance of our efforts will be required for the extraction of the shoulders. If much difficulty exist, we shall be assisted by placing another napkin round the neck; and traction must be used in the direction of the axis of the brim, viz. in a line tending towards the coccyx. It may often even be necessary to introduce a small blunt hook under each axilla in turn, to facilitate the exit of the shoulders; and sometimes, also, to perforate the chest or abdomen, before delivery can be completed.

Baudelocque † counsels that after extraction we should inject the uterus with warm water, to wash away any particles of brain which may be lodging in that cavity, or in the vagina: this, also, I deem useless; because none of the cerebral substance escapes into the uterus, and what lies in the vagina must be perfectly wiped out by the passage of the fœtal body: as forming an unnecessary complication of the operation, therefore, this advice should be rejected.

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* Baudelocque, parag. 1918, Heath's translation, recommends that a suture should be opened if possible.

† Parag. 1921, Heath's translation.

SIGNS OF THE DEATH OF THE FŒTUS.—It is highly desirable—as well for the purpose of regulating our practice, as to prevent our feelings being wounded without cause, in case the child should have already lost its life—that we should be able to determine whether the infant be dead or still living. Many symptoms have been noted as indicative of the loss of fœtal vitality—most of them very equivocal, but some few tolerably certain.

Those signs on which we can place the least reliance are—*First*, the loss of fœtal motion. *Secondly*, a sense of dull weight experienced by the mother in the uterine region. *Thirdly*, a sense of coldness in the womb. *Fourthly*, the meconium coming away under a head presentation. *Fifthly*, a putrescent fœtor in the discharges. *Sixthly*, discharge of flatus from the uterus. *Seventhly*, want of cerebral pulsation.

Those which are much more satisfactory, and which, indeed, with some limitations presently to be mentioned, may be considered conclusive, are—*First*, loss of pulsation in the prolapsed funis. *Secondly*, desquamation of the cuticle. *Thirdly*, looseness of the bones, and breaking up of the texture of the cranium. *Fourthly*, emphysema of the scalp. *Fifthly*, not being able to hear the beat of the fœtal heart, on the application of the stethoscope to the uterine tumour.

I. We often hear it advanced, that the child must be dead, because its movements have not been felt for a length of time, and the mother herself will be persuaded that such is the case; but it by no means follows that the child has lost its life, although no sensation of motion may have been experienced for a number of hours. I have already mentioned my belief,* that, under the compression which the brain suffers in labour, the fœtus is thrown into a state of partial stupor; during the continuance of which it is incapable of moving its limbs, and consequently cannot make any impression on the mother's sensibility. It is acknowledged that the brain will bear with impunity much greater pressure before birth than after breathing life has commenced, because the action of the heart is less dependent on the nervous energy being sound and unimpaired, than is the function of the respiratory organs: compression, then, may have occurred to such an extent as to take away all power of motion, without so far interfering with the function of the brain as to suspend the heart's action. M. Merat,† too, has shown, by many highly interesting experiments, that the vitality of the heart itself in the newly-born animal is much less dependent on the perfection of the nervous system, than after respiration has been continued for some time; and from these experiments it may also be inferred that the heart of the fœtus *in utero* is more independent of that system than it is after birth. Besides,—putting out of our consideration the probable effect of pressure on the brain,—if we recollect how the child's limbs are cramped after the membranes are ruptured, we shall no longer wonder that they are inactive. Its body is firmly embraced by the contracting fibres, and it is by this confinement prevented from moving its limbs so as to impress an impulse on the mother's system.

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* Page 19.

† Dict. des Sciences Médicales, vol. v. p. 452.

II. A dull sensation of heaviness in the uterus has been enumerated as a second sign. It is alleged that, as long as the child is alive, there is a certain degree of buoyancy about it, which is lost when it is dead; and that a feeling of weight is consequently experienced. But this at the best is very questionable.

III. A sense of coldness in the uterus is given as another sign. It is supposed that so long as the child is alive, it forms heat for itself, through the medium of its own circulation; but when it is dead, it abstracts heat from the mother's body, and therefore that she must feel a sensation of cold. It is very possible that this position may be correct, but it does not follow that the inference is a true deduction; and—inasmuch as these signs are all dependent upon the mother's sensations, and consequently upon her sensibility; and as we cannot depend upon the accuracy with which she describes her feelings—we could not rely upon their infallibility, even were they much more positive than they really are.

IV. The coming away of the meconium, when the head presents, is assigned as another evidence of the child's death. It is assumed that the bowels do not naturally evacuate themselves into the uterus; that their contents cannot be squeezed out by the action of the uterine fibres; but only pass in the last death-struggle of the child, or after the sphincter has lost its opposing power. That this does not always hold good I have myself had sufficient proof: besides, a mistake may easily be made on this subject. I have already mentioned, that, generally, a brownish, olive-coloured discharge escapes from the uterus in greater or less quantity, under lingering labour, which has been looked upon as meconium mixed with the liquor amnii; and I have known such an appearance adduced more than once as a proof that the child was dead, when it has afterwards been born strong and healthy.

V. The discharge possessing a putrid odour, is said to be another proof of the infant's death. If the child be putrid, unquestionably the discharges will have a fœtid smell; but it does not follow that the child should be putrid, even though the fluids escaping from the uterus possess an unpleasant fœtor. The discharges may have been pent up within the womb, owing to the head being impacted in the pelvis; and a few hours will be sufficient to induce putrescency. Nay, the liquor amnii has been sometimes observed, at the commencement of labour, to possess a putrescent smell, when the child has been born vigorous. I grant that the odour arising from the mere putrid discharges differs considerably from that emanating from the body of a fœtus dead in utero; and it is very possible that a person, much engaged in operations connected with obstetric surgery, might be able to discriminate between them; of the two, that arising from the death of the child is by far the most sickening: it is, indeed, the most nauseous fume that can possibly assail the nostrils. On some occasions I have with difficulty restrained myself from vomiting, while extracting a putrid child; although from habit I am not very susceptible of such impressions.

VI. A discharge of flatus from the uterus may be regarded exactly in the same light as the appearance of putrid fluid. This gas is generated by putrescency, and will often escape, on an opportunity being given to it, when the finger is carried up to the brim of the pelvis, by the side of the child's head. This, therefore, must be ranked as another most equivocal symptom.

VII. Nor is the inability to discover pulsation through a fontanelle more conclusive. Even at an early period of the labour, when the brow presents, it is very seldom indeed that we are able to distinguish the pulse of the cerebral vessels: how much more difficult, then, must this means of diagnosis become, when the smaller, posterior fontanelle is the depending part; and especially when the scalp is tumid and puffy, owing to the collapse which the bones are suffering!

I. *The symptoms more to be depended upon* are, the funis having prolapsed before the head of the child, having remained without pulsation for a considerable time, and having become cold and flaccid. Here we have a positive proof that death has taken place. But does it necessarily follow that the funis belongs to that child whose head is at the pelvic brim?—Is it not possible that there may be twins in utero?—Is it not possible that both the bags of membranes may have given way, and that the funis of the second or uppermost child may have prolapsed by the head of the first?—If so, might not the first child be alive, though the second was dead?—It is very *possible* that such should be the case; but to produce such an accident, three circumstances must concur—there must exist a plural gestation; the liquor amnii of both children must be evacuated, or they must have lain together in one cyst: and the funis of the second must be preternaturally long, to have so dropped down. It is a most unusual occurrence for the membranes of a second child to burst before the first is born, and equally so for them both to occupy one bag; and the prolapsus of the funis belonging to that child, at the same time, would be such a rare complication of chances as to remove the case entirely out of all calculation: so that we may safely regard the fœtus as dead, if the pulsation in the prolapsed funis have entirely ceased for the period of thirty or forty minutes.

II. Another almost unequivocal sign is desquamation of the cuticle. If, under a head presentation, we can bring away, between our fingers, three or four hairs having some of the cuticle attached to their roots, we may be pretty well assured that the child is dead. But even this is not an infallible sign, for there are cases on record to prove the contrary. A slough may have occurred in the scalp, from long-continued pressure while the child was still alive; and from such a spot the hair and cuticle might be removed without difficulty. Hamilton[*] used to mention a case of this kind; Baudelocque[†] also quotes one; and Dr. Orme[‡] met with another, where, in consequence of cutaneous disease (probably syphilitic), the cuticle easily desquamated. Kennedy,[§] too, has recorded a similar instance, in which there existed "a livid discoloration of the whole body, and a complete denudation of the cuticle, to the extent of several square inches, from different parts of the surface; while the remainder of it was so easily separable, as to be removed by the friction of the clothing;" and yet this child was born alive, and survived its birth several hours. Such accidental occurrences, however, are most uncommon; and if, at the same time with cuticular desquamation, the discharges were very fœtid, no doubt could remain as to the child being lifeless.

III. A third sign is the breaking up of the structure of the head, so that when we touch it, the scalp feels loose, as if it inclosed a number of shells; this is owing to the brain being pulpified, and the membranes connecting the bones having become softened, and having lost a part of their uniting power.

IV. Together with this breaking up of the structure of the head, we usually also observe the next symptom—emphysema of the scalp, which produces a crackling sensation under the fingers; and if these indications be accompanied by the peculiar fœtid odour I have just mentioned, we may be sure that life is extinct. These three occurrences, indeed, can only take place when the child has been dead some time, and putrefaction has advanced to a considerable height.

V. The last, and certainly the most satisfactory means of ascertaining the state of fœtal vitality, is an examination by the stethoscope. Laennec's instrument has been lately used with the view of determining the difficult question of doubtful pregnancy; and, after quickening, the sounds of the heart and of the placental circulation can generally be more or less easily heard, provided sufficient time is given to the inquiry, and sufficient attention is paid to the mode of conducting it. The same means have also been resorted to for the purpose of ascertaining whether the child be alive under lingering labour;* and promises the best results to those who have made auscultation a study. The beat of the fœtal heart, indeed, is attended with such a peculiar, sharp, and rapid *tick*, that when discovered it can scarcely be mistaken, and in labour it is heard much more distinctly than in earlier pregnancy; for not only is it more powerful itself, and therefore capable of impressing a stronger impulse on the ear; but, as the liquor amnii has been evacuated, and the uterine parietes have come into close contact with the fœtal body, there is a greater probability of the sound being communicated through the instrument to our perceptions, than when the uterine parietes are flaccid, and the cavity contains a quantity of water. So that it is much easier to make out, in labour, whether the child is living or dead, than to determine, in a case of doubt, whether pregnancy really exists or not. Dr. Collins, one of the best practical authorities of this age, speaks most decisively and unreservedly on this subject, and his remarks are well entitled to the consideration of all who cultivate the obstetric branch of medicine as a science.† If, then, by the simple application of the stethoscope to the abdomen of the parturient woman, we can decide, in a doubtful case, on the present state of fœtal vitality, we shall be gaining the greatest possible advantage, in a practical point of view, without subjecting the patient to the least pain, danger, or inconvenience; and even without shocking, in the slightest degree, the most delicate or sensitive mind; since it is not required that the whole of the dress should be removed. The placental souffle alone can by no means be relied on, as I am now perfectly convinced, contrary to opinions that I formerly held; for it is heard distinctly, long after the child is dead;* and according to Dubois,† even after the child and placenta are both expelled; for which reason he objects to the term "placental souffle" altogether.

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[*] MS. Lectures, 1821.

[†] Trans. vol. iii. p. 161, note.

[‡] Blundell's Obstetricy, by Castle, p. 552.

[§] On Pregnancy and Auscultation, p. 235.

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* Kennedy, Op. citat. p. 242.

† "I know of no case where the advantage derived from the use of the stethoscope is more fully demonstrated than in the information it enables us to arrive at with regard to the life or death of the fœtus, in the progress of tedious and difficult labours. It is, in my opinion, one of the greatest improvements made in the practice of midwifery." (Collins, Practical Treatise, p. 18.)

I have no personal experience of the value of the stethoscope in determining the position of the fœtus in utero, nor as to whether there are twins or only a single child; because I have never made use of the instrument with the view of deciding these questions. And I cannot help thinking this mode of examination might lead to serious mistakes. It appears to me that the pulsation of the arteries in the cord must be attended with a sound very similar to that of the heart itself; and if so, provided the cord came within range of the stethoscope, it might be erroneously presumed that the heart was situated in that part of the uterine cavity. Again, if the cord was unusually long, and the pulsations of its arteries were heard at two distant places, an inference might be drawn that the beats of two distinct hearts were detected; and that consequently there were two children in utero.

I have not thought it necessary to dwell upon some other symptoms which have been noticed as evidencing the child's death, such as vomiting, shivering, lividity or pallor of the face, discoloured and sunken eye, offensive breath, or extreme languor on the part of the mother; because it must be evident that all these occurrences may take place from many causes entirely referable to the maternal system, and perfectly independent of any impressions derived from the state of the fœtus. It would be a waste of words, therefore, to canvass their separate merits.

Some practitioners, indeed, think it altogether useless to form a diagnosis on the state of fœtal vitality, since we never have recourse to the operation of craniotomy except where delivery has become urgently requisite, and where the perforator affords the only alternative. This is certainly true as a principle, but exceptions to the general rule will constantly occur. On many occasions, if we were quite sure of the child's death, we should be fully warranted in lessening the size of the head, although the case might possibly be terminated by the forceps or the vectis; while on others, if we were equally certain that it was still living, we should be disposed to make a strenuous effort with one or other of those instruments, in the hope of preserving its life; notwithstanding that by so acting, we might subject the woman's structures to some danger of laceration.

Although it is often difficult to distinguish whether the fœtus be still living, *before* the operation is performed, that knowledge is easily gained *after* perforation is accomplished; for, if the heart be acting, as soon as the cerebral vessels are ruptured, a quantity of fluid blood, partly arterial and partly venous, will escape externally; before any portions of brain appear; on the contrary, if the circulation has quite ceased, no *flow* or *jet* of blood will take place, but a number of small clots will come away with the cerebral matter, as it oozes out on the application of our extractive efforts. We shall observe also, on the birth being perfected,—if the fœtus was alive when the perforator was used,—that its whole person, but especially the face and lips, will present an exsanguined look, in consequence of the cuticular vessels, as well as those supplying the internal parts, being drained of their contents: and this bloodless appearance has led me to suppose, that death under these circumstances occurs more frequently from the hæmorrhage which it has sustained, than from the injury inflicted on the brain itself.

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* British and Foreign Med. Review, Oct. 1844, p. 489.

† Med. Chirurg. Review, January, 1842, p. 197.

These remarks, however, are of no importance, practically, in regard to the case under treatment; because, whether the child were dead or not, the act cannot be recalled: the observation is only valuable for our own satisfaction—to bring peace to our mind, and soothe our excited feelings, should we fortunately ascertain that we have not ourselves been the instruments of death, but that it had occurred from the hand of nature; and to determine the correctness or fallacy of our previously formed opinion, in respect to the child's vitality.

To supersede the necessity of resorting to craniotomy, in those cases where the pelvis is so small that a full-timed child cannot pass alive, four different means have been recommended—they are the *Cæsarean operation;* the *section of the symphysis pubis; controlling the growth of the fœtus in utero;* and the *induction of premature labour.*

THE CÆSAREAN OPERATION

consists in dividing the abdominal parietes, cutting into the cavity of the uterus, and extracting the child, placenta, and fœtal membranes, through the incision thus made.*

There is no history in the earlier writers on medicine or surgery of any fœtus having been extracted from the uterus of a woman while alive, by this operation; and the date of its introduction cannot be traced farther back than the sixteenth century.

Rousset, in 1580, published a work in Paris, with the title *ὑστεροτομοτοκία*, in which he strongly advocated the operation, and gave some cases of its performance. This work was translated from the French into Latin, in 1591, by the celebrated Caspar Bauhine, professor of medicine at Basil; and it was chiefly through that publication that the Cæsarean section became so frequently resorted to in France, and other parts of the European continent, after that period. The first successful operation, according to

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* Rousset gave the term *Cæsarean* to this operation:—"Hunc nostrum partum *Cæsarei* nomine inscripserimus."—(Bauhine's trans. chap. 1.) And he seems to have adopted it from Pliny's statement, that the Roman family of the Cæsars had that surname given to them, because the first of that family was extracted from the womb of his mother, when she was almost dead. "Auspicatiùs enectâ parente gignuntur: sicut Scipio Africanus prior natus, *primusque Cæsarum, a cæso matris utero dictus.*"—(Nat. Hist. lib. vii. cap. 9; edit. in usum Delph.)

Bauhine, was performed at Siegenhausen, by a cattle-gelder named Alespachen, on his own wife, about the year 1500. She afterwards bore several children naturally.*

I have already stated,† that out of at least fifty-two instances in which the Cæsarean section has been resorted to in the British Isles, in five only has it proved quite successful, as far as the preservation of the mother was concerned; and I have endeavoured to account for the great disparity in the result between these and the continental cases. I have also attempted to lay down a rule, limiting the instances of pelvic distortion, or tumours, in which it may be necessary; requiring it at the same time to be borne in mind, that in Britain we never substitute it for craniotomy by choice, but only have recourse to it when no other mode of delivery is practicable.

Mode of performance.—The patient need not be removed from the bed; but, lying on her back, with her head and shoulders raised by pillows, she should be brought to the edge, so that her feet may hang down towards the floor. The membranes having been ruptured *per vaginam*, if the liquor amnii is not already evacuated, the bladder perfectly emptied, and the apartment brought to a temperature of at least eighty degrees of Fahrenheit's thermometer, an incision of about six inches in length must be made through the abdominal parietes below the navel, parallel with the linea alba, a little on the right or left side of that line; to be determined by the convenience of the operator, and other circumstances of the case. Another incision, similar to the first, must be made into the cavity of the uterus—the hand introduced, the membranes torn, and the child extracted by the feet, with all convenient speed: the placenta must be abstracted also through the same opening, as quickly as is consistent with safety. On the uterine cavity being evacuated, the organ will contract more or less perfectly; hæmorrhage will thus be prevented, as well from the divided vessels as those over which the placenta had been attached; and there will be no need of sutures to bring the edges of the uterine wound together. The abdominal parietes, however, will require two, or perhaps three sutures: the surfaces must be dressed according to the common principles of surgery; the heat of the apartment gradually lessened; a tolerably powerful opiate administered; and other means used to allay irritability, and avert inflammation or fever. A warm bath should be in readiness, and the proper requisites prepared to resuscitate the child, if animation be suspended.*

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* Page 162, Bauhine's translation. Bauhine also gives a case where a woman had three children after this operation, *per vias naturales*, and another on whom the operation was performed twice. Some have supposed these operations were craniotomy, and not the Cæsarean section. For further notices of the history of the Cæsarean section, see Appendix G.

† Page 214.

The cautions which we have particularly to attend to in the performance of this operation, are, *First*, not to divide the tendinous expansion of the recti muscles forming the linea alba; because we should not expect union to take place so kindly in that lowly organized structure, as in the body of the muscle itself; nor to make the incision so much towards the side as to endanger wounding the epigastric artery. *Secondly*, not to allow the naked surface of the uterus to remain exposed for a longer time than can be helped, and especially not to handle the organ more than is absolutely necessary. *Thirdly*, not to make the incision at the side of the uterus; because there the largest uterine vessels take their course. *Fourthly*, not to let much time elapse between the extraction of the child and placenta; and, *Fifthly*, to be most careful that none of the intestines become strangulated, by passing through the aperture into the uterine cavity.—And the dangers which we have to fear are, the excessive shock which such a formidable incision must produce on an unhealthy, debilitated, and perhaps exhausted frame; hæmorrhage both from the uterine vessels and those supplying the abdominal parietes, and subsequent inflammation.

It is very possible that the patient may sink rapidly after the operation, from the sudden shock experienced by the nervous system; but this has seldom occurred. Less frequently stil has hæmorrhage destroyed; for, contrary to what we might *à priori* have expected, the bleeding has generally been comparatively trifling. Hull tells us that in both his cases the loss of blood was but small.† The same remark applies to two of Barlow's ‡ cases, although in one the placenta was attache directly against that portion of the uterus through which the incision was made; also to a case detailed by Mr. Thomson,§ and to most others recorded. Lauverjat, a French author, towards the end of the last century, who performed the operatio five times,—three of which cases terminated favourably for the mother,—recommends even that the loss of blood should be artificially promoted, by separating the placenta, and placing a warmed drinking-glass over the denuded surface; "that such a quantity of blood may escape as is judged necessary to unloa the uterine vessels sufficiently." ‖ He confesses that this advice is very different from that previously given by those authors wh had written on the subject; for they all, fearing excessive hæmorrhage, insist on the necessity of avoiding the placenta. Lauverjat, indeed, may possibly have carried his principle too far; but as he had himself operated in five cases, his opinion proves that the principal objection of Paré,[*] his pupil Guillemeau,[†] and others, who dreaded the excessive hæmorrhage they fancied must ensue, was speculative and hypothetical.

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* For the means of restoring the child under these circumstances, see Appendix L

† Letter to Simmonds, in defence of the Cæsarean section, p. 44.

‡ Essays in Surgery and Midwifery, cases 1 and 3.

§ Medical Observations and Enquiries, vol. iv.

‖ Nouvelle Méthode de pratiquer l'Operation Cesarienne. Paris, 1788.

By far the greatest number of deaths have happened from inflammation supervening, and in some cases terminating in gangrene: such, then, is the evil we have principally to dread. It was suggested by the ingenious Dr. Aitkin,[‡] of Edinburgh, that the injury produced on the peritoneum was the effect, not so much of the violence it suffered from the incision, as of the introduction of atmospheric air into the abdominal cavity, and the irritation consequent on its admission: and he proposed—to obviate this chance of danger—that the operation should be performed while the patient was in a warm bath. I do not know that his suggestion has ever been adopted; and I am inclined to think the inconvenience attending such a mode of proceeding would render the operation much more difficult and complicated. Besides, it is very questionable whether his position be correct; for the abdominal cavity in dogs and other animals has been injected with air introduced into the tunica vaginalis, and passed through the ring, without any other inconvenience being sustained beyond what the bulk and distension produced; and it has been found that in time the elastic fluid was absorbed. From these experiments, as well as from observations on the human subject in the case of accidental wounds of the abdomen, there is good reason to think that the cause of danger is the actual incision, and not the admission of atmospheric air.

Blundell[§] suggests, if we are called upon to perform this dreadful operation, that we should endeavour to prevent the possibility of the woman again conceiving. He therefore proposes that, after the child is extracted, we should destroy the continuity of the Fallopian tube on each side, by removing a small portion of its substance. By this means we should not take away desire, though we should prevent the possibility of conception.

Although in Britain we restrict this operation on the *living* subject to such extreme disproportion as must render its performance very infrequent indeed, yet the case is widely different when the mother has expired, and any suspicion is entertained of the child's survival. Should sudden death occur in labour, or during the last two months of pregnancy, it would be the bounden duty of the attendant surgeon, after having stated to the friends the probability of saving the child's life, to proceed, without delay to extract it by the abdominal incision; and if such means were used within fifteen or twenty minutes of the mother's decease, the result would probably be favourable.

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[*] Johnson's translation, lib. 24, cap. 31.

[†] De la Grossesse et Accouchemens des Femmes, 1643, p. 228.

[‡] Principles of Midwifery. Third Edition, p. 82.

[§] Obstetricy, by Castle, p. 566.

SECTION OF THE SYMPHYSIS PUBIS.

A second means proposed for the purpose of superseding the necessity of destroying the child, is the division of the symphysis pubis, called, after the name of the proposer, M. Sigault—the Sigaultean operation.

It was formerly generally supposed that the ligaments of the pelvis gave way during parturition: being impressed with these sentiments, and having imbibed the opinions of Severin Pineau,* and the older anatomists, "*ossa pelvis, non tantum dilatari, sed etiam secari tutò possunt,*" in 1768, M. Sigault, then a student, proposed to the Royal Academy of Paris to enlarge the pelvis under contraction, by cutting the symphysis pubis. The suggestions were referred to a committee of that learned body; and these gentlemen having taken into consideration. that when the bones were separated by disease, the effects of that separation were dreadful, permanent lameness being the result, reported that the operation was not justifiable, but gave the proposer great credit for his ingenuity. Although, however, Sigault received such a rebuff at the outset, he was not to be deterred from his purpose; and in September, 1777, he, assisted by M. Alphonse le Roy, performed the operation on a patient named Souchôt. The operation is described as being simple; the child was born alive, and in six weeks the patient was shown to the medical faculty apparently well.† But notwithstanding that the supporters of symphyseotomy boasted of the case as one of perfect recovery, the bladder was so much injured that she was never able to retain her urine so long as she lived.‡

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* Opusc. Physiolog. et Anatom. lib. ii. cap. 10.

† Mons. Alph. le Roy states that a French physician at Warsaw had performed Sigault's operation in the seventeenth century. (See his pamphlet, entitled *Examen de l'Art des Accouchemens de M. B.*, ext. de la Gazette de Santé, année 1781.)

‡ Among some manuscript papers of the late Dr. Dennison, which came into my possession, I find a note that he had seen this patient while in Paris, and should have considered her quite well, "had not his nose informed him that she could not retain her urine." The praise bestowed on M. Sigault in Paris, and throughout France, was quite unprecedented; a medal was struck, by order of the faculty of Paris, bearing the motto "*Sectio Symph. oss. pub. lucina nova, anno* 1768 *invenit proposuit,* 1777 *fecit*

Denman* states, that when the accounts of the supposed success of this operation were brought to England, he had a conference with John Hunter on the subject: and it was determined, as far as the safety of the woman was concerned, that if the good contemplated could result, the section of the symphysis itself would not warrant opposition to it; but with regard to its utility, it was necessary that experiments should be made to establish that point. These experiments were afterwards made in the dissecting room by Dr. William Hunter, and it was proved that, by a simple division of the pubes, although the bones spontaneously separated somewhat, very little space was gained; but for that object it required that they should be wrenched asunder, to the imminent danger of the sacro-iliac ligaments and joint, and especially also of the bladder and its attachments. I have already proved that in cases of distortion the diminution of space is principally in the conjugate diameter; and it was found that, in order to increase this diameter one inch, the pubes must be separated three inches; and to increase it half an inch, there must be a separation to the extent of two inches. It was proved, also, that if a separation of an inch and a half only took place, laceration of the sacro-iliac ligaments occurred; and it may well be presumed that this must be attended with fatal consequences.†

It must be evident from this statement, that the operation is not justifiable in cases of the more deplorable distortion of the pelvis, and therefore, in England at least, it cannot supersede the Cæsarean section: nor is it justifiable in the smaller degrees of diminution, because in them craniotomy can be performed; and it has been laid down as a maxim, that we must even sacrifice the life of the fœtus, if that be necessary to preserve the woman's

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feliciter J. R. Sigault, D.M.P. Juvit Alph. le Roy, D.M.P.," to commemorate the event; a royal pension was granted to him, and the applause he received was perfectly extravagant: greater exultation he could scarcely have enjoyed, if he had devised a method to remove female nature beyond the pale of all the pains and dangers connected with parturition. (Baudelocque, parag. 1997, Heath's translation.) In no other country, perhaps, but among our enthusiastic and volatile neighbours, would an operation of such a kind, resting on one solitary trial alone, have given rise to so universal a triumph. Soon it was repeated, with various success, on the continent: of forty-four women who were subjected to this operation in different countries, fourteen died, and many of those who survived were grievously injured for life; and of the children not more than fifteen were saved.—(Merriman's Synopsis, p. 168.) There is only one case on record in which it was performed in Great Britain; Mr. Welchman was the operator; and an account of it will be found in the London Med. Journal for 1790, p. 46.

* System of Midwifery, chap. xii. sec. xi.

† See, in confirmation, the details of some interesting experiments by Baudelocque, par. 2006, *et seq.*, translation; and Velpeau, edit. Bruxel. p. 446. Also, "Reflections occasioned by a decree of the Faculty of Medicine at Paris relative to the operation of cutting the Symphysis Pubis," by Dr. Hunter, in a letter to Dr. Vaughan, of Leicester, Sept. 1778. And for a succinct history of this operation, Churchill's Op. Mid. p. 235.

structures from such dangerous injuries as the section of the symphysis and separation of the pubic bones must occasion. The division of these bones, then, can neither become a substitute for the Cæsarean operation, nor for craniotomy; it is now never thought of in England as a means of delivery, and is also, I believe, totally exploded from continental practice.[*]

CONTROLLING THE GROWTH OF THE FŒTUS IN UTERO.

In the lesser degrees of deformity (putting those aside which would require our having recourse to the Cæsarean section, and which fortunately occur so rarely as to place them almost beyond the bounds of calculation), it becomes a great object that we should be saved the necessity, for the preservation of the woman's life, of destroying each child that she conceives; and with this view the third expedient has been attempted,—*controlling the growth of the fœtus in utero.*

It was with justice supposed, that if the growth of the child in utero could be regulated so as to prevent its rapid increase, it would pass through a contracted space so much the more readily, and that this might be accomplished through the medium of the mother's system. The idea was suggested by the late Mr. Lucas,[†] of Leeds, who adduces some instances in which a spare diet appeared to be usefully enjoined. Analogical reasoning was brought to bear on the question; and it was argued that if cows were kept in a luxuriant pasture, their calves were much larger and stronger than if their food was less plentifully supplied. Abstinence was therefore recommended in the human subject. This possibly may be the case with cows; but even if it be, the principle, unfortunately, does not hold good with regard to our own species; both the observation of disease, and direct experiment, prove the contrary. We observe that women labouring under the last stage of the most debilitating diseases, such as phthisis, often bring forth plump and well-nourished children. We remark also, frequently, that the vomiting which usually attends the first weeks of pregnancy continues almost uninterruptedly during the entire period, so that scarcely the whole of any meal is retained upon the stomach; and that the patient becomes much emaciated under the debilitating effects consequent: yet the nutrition of the fœtus is not interfered with; but it is born strong, hearty, and of full size.* But the question has been settled by experiments made directly for the purpose; and it has been shown beyond a doubt, that whatever influence the regimen adopted by a pregnant woman may have on the development of her fœtus, the system of diet cannot be reckoned among the resources of our art, to be depended upon in the least degree.†

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[*] For a detailed history of the cases in which the section of the pubes was undertaken in France, and the sad effects that resulted in most of them, I would refer to Baudelocque's account, published in the second and subsequent editions of his work, "*L'Art des Accouchemens.*"

An operation somewhat similar, but much more horrible in character, was proposed by Dr. Galbiati, of Naples, in 1832, and performed by him in that year. The patient was only "three feet and a half and some inches" high, and the pelvis measured "about an inch between the promontory of the sacrum and the pubes; between the same and the right ilium, about an inch and a half, or a little more; and between the same and the left ilium, only a few lines." The operation was commenced at 7 P.M., March 30th. The rami of the pubis and ischium of the right side were sawn through, as near the acetabulum as possible, and the symphysis pubis divided; as the space thus gained, however, was found to be insufficient for the head's descent, at 11 P.M., April 1st, the bones on the left side were cut in the same manner as had been done on the right, and the head was brought down into the pelvis by the forceps. The child was now discovered to be dead, and the case was, therefore, terminated by destroying the texture of the head. The woman died on the 3rd, at 5 A.M. The operation was sanctioned by other practitioners.—(La Pelviotomia ragguaglia di una nuova operazione di chirurgia che puo con vantagio sostituirsi alla Cæsarea.)—Gen. Galbiati Napoli, 1832.

It might have been hoped and expected, that so barbarous a proceeding as that just detailed would neither have been repeated by the original performer, nor have found any imitators. Yet an operation of the same kind, if not even more dreadful, was undertaken at Naples by M. Ippolyto, in Galbiati's presence, towards the close of 1842, or commencement of 1843. It is reported in *Il Filiatre Sibezio*, and there styled *bipubiotomy*. See an abridgement of it, with some excellent remarks, severe, but most richly deserved, by the Editor of the Med. Chirurg. Review, April, 1843, p. 504.

[†] Mem. Medical Society, London, vol. ii p. 412.

INDUCTION OF PREMATURE LABOUR.

Nature herself first pointed out the most likely means to remedy the evils which disease had entailed. It must necessarily have been observed that when a woman possessing a small pelvis went into labour prematurely, her infant passed with little difficulty. Thus practitioners were led to reason on the subject, and to endeavour to induce uterine action before the termination of gestation, in consideration of the amazing growth that the fœtus undergoes during the last two months, and the probability that a child would be reared if born after the completion of the seventh. Denman* records, that in 1756 a solemn consultation between the obstetrical practitioners in London took place on the subject, in which the morality, safety, and utility of the means were fully discussed.

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* Baudelocque, par. 1992, Heath's translation. See also the 117th and 118th cases of La Motte, Paris, 1765, to prove that, although the mother may be reduced to the lowest degree of feebleness for want of nourishment, the child may be large and well fed.—For the Effect of Diet on Pregnant Females, see Merriman's Synopsis, p. 299.

† The French surgeons, as I have already said, do not sanction the destruction of the child for the sake of saving the mother's life; and M. Depoul has again advised endeavouring to arrest the development of the fœtus in the cases under consideration. Following up this view, M. Delfrayssé has proposed the use of iodine for that object; and in the Medical Times for June 8th, 1850, will be found the notice of three cases in which he succeeded completely by the use of this medicine. Two of them occurred in the same patient. The medicine was given once a day for the last two months of pregnancy. The children were carried to the full time, and were all healthy and vigorous. One weighed twenty-two ounces and three quarters, the other twenty-three ounces and a half less than the former infants of the same parent; and the third three pounds and a half less than those the patient had previously borne. The form employed was one scruple of iodine and two of iodurет of potassium, dissolved in an ounce of water, of which six or eight drops were given for a dose. I am not aware of this plan ever having been adopted in this country; but if a pregnant woman, the possessor of a small pelvis, should obstinately refuse to allow premature labour to be induced, when that expedient was thought necessary, it might be worth while to place her under this system, in the hope that we might share the good fortune which M. Delfrayssé has met with.

As to the *morality*, there can be but one opinion. If the life of the child can probably be saved, and if much danger can be averted from the mother, the morality, as a surgical means of procuring a great benefit, must be self-evident. Should premature labour or abortion be induced, to screen an individual from the just reproaches of the world, or to cast into oblivion the evidence of the gratification of a criminal passion, then, indeed, is murder committed in law and reason: but as our object, under the circumstances now treated of, is to save life, and as probably two beings may at the same time be preserved to society by the means proposed, the profession now entertains no question as to its morality, when imperious necessity dictates it.

With regard to the *safety* also, all must be agreed; for how much more likely is the woman to survive, having passed a fœtus, after a comparatively short labour, which may weigh five pounds, or five pounds and a half, and but little ossified, than if she produce one at the full time, weighing seven pounds or more, whose osseous system is well developed, after a difficult and protracted struggle, terminated too by instrumental delivery.

The *utility*, indeed, as far as regards the preservation of the child's life, becomes a separate question: and Baudelocque † has reasoned speculatively against it. The strongest argument he uses is, that when the liquor amnii is discharged after the rupture of the membranes, there must be such a degree of pressure on the funis umbilicalis and the body of the child as to destroy its life; especially as the os uteri will most likely dilate with difficulty. It certainly is true, that more children are born-dead, after the induction of premature labour, than if they come into the world at the full time; but provided we can snatch only a proportion from death, our object is in a very great measure gained.‡

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* System of Midwifery, chap. xii. sect. x. Dr. Macauley was the first physician in London who induced premature labour with success, about the year above mentioned. (Denman, loc. sit.)

† Par. 1983, *et seq.*, translation.

‡ Professor Hamilton states (Practical Observations, 1840, p. 285) that of forty-six

Difficulties in effecting the object.—The difficulties we have to contend with in our endeavours to save the child under the induction of premature labour, are no doubt great; and the following may be enumerated:—*First*, the pressure on the navel-string may destroy its existence, as advanced by Baudelocque. There can be no doubt that so long as the membranes are whole, however strongly the uterus may act, the pressure on the fœtal body and funis is inconsiderable, owing to the quantity of inelastic fluid which the womb contains. But as soon as the water is evacuated, when the parietes of the uterus come into close contact with the body of the child, it is very possible that the vessels both in the funis umbilicalis and in the placenta may suffer such injurious compression as will destroy the child's life; and this must therefore be looked upon as one of the chances militating against success.

Secondly, it is observed that children more frequently present in a preternatural position, when expelled before the end of gestation, than after the full time is completed. At a particular period of pregnancy the fœtus assumes a definite posture, from which it seldom after varies. What this precise period is, I have no direct means of judging: probably it differs much in different cases; but the fact is undoubted, that *cross births* are more frequently met with in premature labour, either spontaneous or artificial, than in full-timed pregnancies. Of thirty-four children born after the induction of premature labour—which cases came under the

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infants thus prematurely brought into the world by his agency, forty-two were born alive; and that in one patient he performed the operation upon ten different occasions. Much greater success has attended Hamilton's endeavours than I can boast of. In my practice, however, more than one-half have been born alive, and might live to maturity. It has occurred to me to be compelled to induce labour prematurely ninety-one times. This may seem, perhaps, a very large number; and, in explanation, I may state that the extensive charity which has supplied the principal part of these cases, embraces the district of Spitalfields and Bethnal Green, which parishes, I have reason to believe, contain more females with deformed pelves, congregated together, than are to be met with over the same quantity of square acres in any other part of this kingdom. When, also, it is taken into consideration, that in most of the patients the operation has been repeated, and that some have undergone it five and six times, the subjects of it will be found to be comparatively few. Out of these ninety-one, one was a twin case; and of the ninety-two children, forty-nine were born alive. But suppose even that the child should be born dead, still we are giving to the mother the best, and to it the only, chance of life; and we save the mother, at the same time, a great deal of personal suffering. Only one of these ninety-one women died; that was a transverse case, and the patient was delivered by decapitation. Of the forty-three dead children, thirteen presented with the breech or feet, and three transversely; in five craniotomy was performed, and with one the funis prolapsed. Three others presented transversely, and were extracted living. In thirty-four of these cases labour was brought on by the ergot alone; that is, the children were born within four hours of the membranes being ruptured. In twelve, by the combined agency of the ergot and puncturing the membranes, after the os uteri had become softened and somewhat dilated. Eleven of these were born living. For further particulars of these cases, see Med. Times and Gazette, Jan. 7th, 1854, p. 9; and 14th, p. 33.

knowledge of Dr. Merriman*—fifteen presented preternaturally, and only one of these was saved.† The same observation I have myself made, though the proportion has not been so large; for of the ninety-two children alluded to in the note, nineteen presented preternaturally; and Dubois‡ has stated, that in the *Maternité* at Paris, during the year 1829, and the three following, out of one hundred and twenty-two children born before the completion of seven months, in fifty-one cases the pelvis offered itself, and in five the shoulder; making a total of nearly one-half preternatural presentations. Thus, then, if the shoulder or breech present, we shall have little chance of saving the child; because,—besides the ordinary cause of danger,—the pressure on the funis umbilicalis must be great when the head is passing the brim; for I presume on there being a want of space to warrant a recourse to the means used. Barlow,§ indeed, states that he is induced to believe preternatural presentations are more frequently met with under distortion of the pelvis, than when that organ is well formed. This remark coincides with my own observations; but how a contraction of the pelvic brim can influence the position of the fœtus in utero, it is difficult to explain, or even imagine.

The *third* difficulty we have to contend with, is the chance of deception regarding the period of pregnancy at which the operation is undertaken. Women are very liable to be deceived in their reckoning; they may fancy they are advanced farther than is really the case, and their representations may induce us to bring on uterine action before the fœtus has acquired such a degree of perfection as to enable it to sustain independent existence:—or, on the other hand, the patient may have been pregnant before she was aware of it; and we may delay the operation until it is too late—until the child is of too great a bulk, and too strongly ossified, to pass through the particular pelvis under our immediate notice; and we may consequently, in the end, be compelled to resort to craniotomy; as has occurred to myself in the five instances, adverted to in the note. Though these difficulties, then, are some drawback to our success in anticipating the proper period of labour, yet they are by no means such as would induce us to discard the benefits it holds out.

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* Synopsis, p. 172.

† Hamilton looks upon this large proportion of preternatural presentations as very extraordinary (Op. Cit. p. 283); and states (p. 289) that out of fifty-nine cases "under his care, and that of the medical attendants of the Edinburgh Lying-in Hospital, there were only five such." Dubois' returns, Merriman's observations, and my own practice, would tend to prove it was not so remarkable as the professor imagined.

‡ Mem. de l'Académie Royale de Médicine, tom. ii. p. 271.

§ Essays on Surgery and Midwifery, p. 348. Denman (chap. xiv. sect. 8) seems to lean to this opinion also.

Means adopted.—Various modes, both by internal medicines, and manual operation, have been proposed for the purpose of bringing on premature labour. Of these, the only positively sure method consists in the destruction of the integrity of the ovum; but when this is effected, the process of gestation is certainly interrupted, and that of labour soon commences. The operation requires that we should possess a most accurate knowledge of the anatomy both of the ovum and the maternal structures, and be well acquainted with the state of development which the cervix uteri assumes at different periods of pregnancy; else the most serious evils may result, as is testified, indeed, by the criminal records of many civilized nations.

Some years ago I had an instrument made, of very simple construction, on the principle of the tonsil-lancet, but shaped like a female catheter, which I have been in the habit of employing with the intent of putting a stop to the process of gestation in those unfortunate cases where the formation of the woman precludes the hope that she will be able to bear a child at the perfection of its intra-uterine maturity.[*]

Unless a quantity of water is present between the two layers of the fœtal membranes, the prescribed method will *invariably* induce uterine action earlier or later; but should the amnion still remain entire, gestation may, and probably will, proceed uninterrupted. The time which elapses between the operation and the commencement of parturient pains, varies exceedingly. I have known the uterus begin to act in ten hours, and I have also known nearly a week pass. We usually observe that in fifty or sixty hours uterine contraction is fully established.

If it is proposed to induce labour prematurely, by opening at once into the amnial cyst, the kind of instrument I have just adverted to will answer the purpose perfectly well, and, in the hands of a practitioner acquainted with the anatomy of the structures, the mouth and neck of the uterus will be sufficiently protected from any chance of injury. But by allowing the liquor amnii to drain away before the os uteri is dilated—which must necessarily happen when the ovular membranes are punctured—the fœtal body will be subjected to such pressure as greatly to endanger its existence. This consideration led some practitioners[†] to adopt a different method.[‡]

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[*] The following sentence briefly describes the mode of using it:—Duobus sinistræ manûs digitis, primo secundoque videlicet, in vaginam intromissis, index per os uteri inserendus est: deindè instrumentum, illo digito directum, usque ad ovuli membranas adferendum; quo facto ejus punctum occultum dextræ manûs pollice intùs pressum tenuia fœtûs involucra facilè aperit, aqua uterina per canalem argenteum liberè fluit, partûsque dolores mox supervenient.

[†] Hamilton, Op. Cit. p. 284. See also Davis's Operat. Mid. p. 280.

[‡] Ab uteri ore membranas, digito immisso, ad pollicis circiter spatium undique

Could we always rely on success following the proceedings mentioned in the last note, they would, no doubt, either of them be much preferable, both on the mother's and child's account, to the one more commonly practised; but I have found them fail in most of the instances where I have adopted them. Nevertheless, being impressed with the great advantage of preserving the membranes whole, I made some experiments with a medicine,[*] now well known, and found expulsive action soon follow its exhibition, with very few exceptions, whenever I administered it.

After a great number of trials, however, I observed that, although the mothers recovered as well as if they had gone through an ordinary labour, their systems not being in any sensible degree injuriously affected by the drug, (and in some instances between thirty and forty doses were taken,) yet that the proportion of children born still, was greater than when the membranes were punctured. This I attributed to the baneful influence of the medicine upon the fœtus;[†] I was consequently led to modify the practice; and I am now in the habit of administering four or five doses, at intervals of four or six hours, and of rupturing the membranes after their exhibition. I have generally remarked that the os uteri has become soft, and somewhat opened under the action of the drug; and more children have been saved by this plan, than any other which I have tried.

In the year 1846, Professor Kiwisch proposed to bring on premature labour by injecting a stream of warm water with some force against the os uteri. His apparatus, of a rather complicated character, is delineated by Scanzoni, in the third volume of

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separant; mucum viscosum ex cervice demovent; et irritationem adeo excitatam satis esse ad partum præmaturum inducendum existimant. Alii penicillum, ex spongiâ fabricatum, intra oris uteri labia inseri docuerunt, atque illic teneri, donec humoribus absorptis tumefactum, orbem distendit, aperitque, et uteri ipsius vim ad contractionem incitat. (Vide Simpson, Obstetr. Mem., p. 838.)

[*] The following is the form I have been accustomed to use:—

℞ Secalis Cornuti recentis, in pulverem redacti, ʒiij.; aquæ ferventis, ℥viij.
Infunde vase levitèr clauso per semihoram, et

℞ Liquoris Colati, ℥vii ß.; Acidi Sulphurici Dil., ʒß; Syrupi, ʒij.; Spiritus Cinnamomi, ʒij. M. sumantur cochl. duo magna 4tâ quâque horâ.

Partûs dolores decem vel duodecim elapsis horis ægram vexare, et post singulas medicinæ potiones manifeste augeri, sæpe inveni; aliquando etiam oriri primo potato haustu.

Ingleby (Obstet. Med. p. 232) mentions his having brought on premature labour in two cases by the same means. He says the medicine "clearly originated uterine contraction."

[†] See a paper by Dr. Beatty (Dublin Jour. of Med. Science, May, 1844), enforcing the poisonous effects of the ergot upon the child, if given in large quantities. It is a curious fact, but one of which I am perfectly convinced, that if this medicine does not occasion expulsive action, no effect whatever is produced upon the child's system, however large a quantity may have been swallowed by the mother.

Lehrbuch der Geburtshilfe, p. 54.* Dr. Simpson has succeeded satisfactorily with the enema syringe.†

When necessary.—Unless deformity of the person generally, and of the pelvis in particular, exist to an extreme degree, the induction of premature labour in a first pregnancy is not to be thought of; for it is impossible to become acquainted with the *exact* size of the different diameters of the pelvis, except during labour; and in the cases ordinarily met with, no one would be justified in having recourse to so serious a measure, if he had not accurately ascertained the dimensions by personal examination—and that under the most favourable circumstances for obtaining the required information.‡

It becomes a question of very great nicety, what degree of contraction would warrant us in proposing this measure. Since it has been frequently laid down as a principle, that a child at full time may pass through a pelvis containing in its conjugate diameter at the brim three inches, we may hope, if the aperture exceed that dimension, that the fœtus may be born living, naturally, provided the outlet be well formed: and with this space we should not be inclined to adopt any means by which gestation might be suspended, unless, indeed, some extraordinary circumstances called for our interference; such as the patient invariably bearing very large children, or other accidental causes equally uncontrollable.

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* Schweighauser, in 1835, suggested, though he did not recommend us "de provoquer l'accouchement premature au moyen d'injections, pour decoller les membranes de la matrice." (La Pratique des Accouchmens, p. 274.)

† Obstetrical Memoirs, vol. i. p. 841; which may be consulted for the easiest method of separating the membranes from within the cervix uteri.

‡ The liability incurred by every man in undertaking to bring on labour prematurely, is so great that it makes it most desirable—nay, even absolutely necessary—for the sake of his own character, that he should not perform any operation with that view, until a consultation is held upon the case, and the means proposed is sanctioned by some other practitioner. I would particularly warn my younger brethren against acting on the representations of the patient herself alone; and of the following two cases, one will point out the necessity of such a caution. In the year 1825, I was applied to by a woman, of whom I had no previous knowledge, to induce labour prematurely. She stated that she had lived at the west end of London, but had come to reside in the City, not far from my residence at that time; that two of her children had been destroyed, and that twice, also, premature labour had been induced by a highly respectable practitioner in the neighbourhood where she had lived. I wrote to this gentleman on the subject, who gave me such satisfactory reasons for what he had done, that I had no hesitation in acceding to her request. Since that time I have brought on labour prematurely for that woman on five different occasions.

In the year 1831, my father was applied to by a patient, also to induce labour. She stated that her child had been destroyed in the birth by a physician practising at the western part of the metropolis—a gentleman who holds a high rank in the profession; and that she never could bear a living child at full time. My father took the precaution to see this gentleman, that he might learn from him the particulars of the case, and was informed that the woman was believed to be unmarried, that she had placed herself under the care of a midwife, and that he had been applied to in consequence of a violent attack of convulsions which occurred during the labour; on which account alone he had thought it requisite to perforate the head. My father then refused to comply with her wishes; but she, still desirous of placing herself under his care, took apartments in the neighbourhood, and gestation was allowed to proceed to its termination. My father attended her. Some delay occurred in the labour, which induced him to request my assistance, and I delivered her of a living child by means of the forceps. We found a slight contraction at the outlet of the pelvis, which was the occasion of the difficulty experienced. I have great doubts that her object in desiring to have premature labour induced, was the preservation of her infant.

If, then, the conjugate diameter measure a little less than three inches, we may allow pregnancy to advance to the end of eight months; if about two inches and three-quarters, to seven months and a half; if about two inches and a half, it must not proceed beyond seven months; if the space be less than two inches and a half, it would be certainly unsafe to delay our means beyond seven months; and I would be inclined to induce labour rather sooner; because children of an earlier period have been reared.*

It is a prejudice as old as Hippocrates' time,† that a child of seven months is more likely to live than one of eight months' intra-uterine age; and it is still in force among the common people, not only in this country, but on the Continent. Such an opinion, however, is contrary to experience as well as to analogy, and all philosophical reasoning; for we should certainly expect that the longer the fœtus remained in utero, the more completely would the respiratory and digestive apparatus be perfected; and the greater capability would it have acquired to sustain an independent existence. This supposition, in fact, we find practically verified: and we should therefore delay our attempts until the last day which we think consistent with its passage through the pelvis entire and uninjured.‡

Other circumstances may, however, call for the necessity of our interference, besides diminution of the pelvic capacity: thus, if it should have occurred to the same woman, in a number of successive pregnancies, to be aware of the death of her infant at a particular period towards the close of gestation,—about the termination of the eighth month, for instance,—and if the death was to be attributed to deficiency of nourishment, or any other

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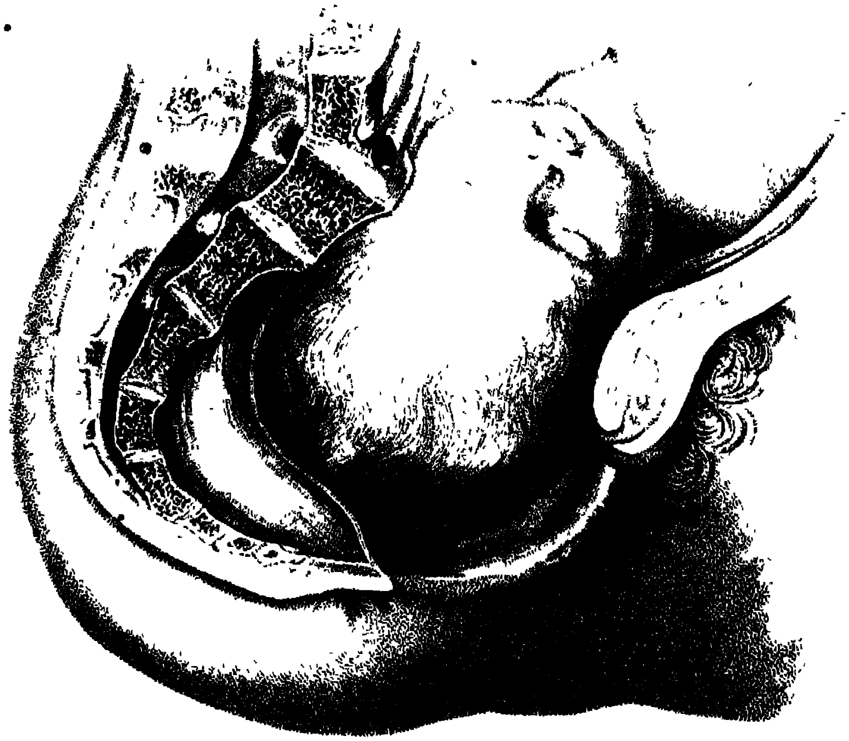
* In one case I thought it right to bring on labour at six months and a half, scarcely anticipating, however, to save the child; because, having delivered the patient previously by craniotomy, I had a full knowledge of the very small size of the pelvis she possessed. Even at this early period, I found the child had acquired too great a bulk to pass entire, and I was obliged to open the head. I was afterwards told that this poor creature went to Malta with her husband, and there died in labour.

† Merriman, p. 303. Barlow, p. 316.

‡ Plate 60 shows a premature head passing through a contracted pelvis, and well displays the compressibility of the skull.



cause decidedly referable to the maternal system, it would become a matter for consideration, whether a chance of life might not be afforded to her future infants by the induction of labour before the usual period of their death. Under such a state, however, it would be necessary to weigh most minutely every circumstance connected with the case, and all the peculiarities attendant on it.*

Other states of disease, in which the mother's life is placed in imminent jeopardy,—provided there is good reason to suppose her danger is aggravated by the continuance of pregnancy,—may warrant us in having recourse to the induction of premature labour: thus, Hamilton† used to say he had twice resorted to the expedient, with the view of preserving the mother; in one of which cases dropsy induced him, and the other, deadly exhaustion and depressed vital powers. For such anomalous cases, however, it must be evident that no general rule can by possibility be laid down.

It would be right, in every instance where premature action is induced, that a wet-nurse should be engaged to take charge of the child immediately upon its birth.

CONSEQUENCES OF LABORIOUS LABOUR.

Exhaustion.—After lingering labours, whether instruments have been used or not, the generality of women recover tolerably well; but occasionally very bad symptoms manifest themselves, the consequence of depression from loss of power, excitement, or injurious pressure.

Sometimes the system falls into a state of exhaustion, from which it never rallies. The symptoms indicating such a condition would usually be observed before instruments were had recourse to: under it the mental and bodily powers are completely worn out; the pulse flags; the extremities become cold; there are excessive weariness of the limbs, vomiting, sunken features, and a hollow eye; probably no pain is complained of, and the expression of the face is sufficient to indicate the danger. Domestic stimulants, nourishment, cordial medicines, opium, ether, and ammonia, are the best and only means to restore the ebbing vitality.

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* On one occasion I was consulted by a pregnant woman for a small tumour at the upper part of the thigh, which was evidently of a malignant nature; it increased so rapidly, that it was clear, if she were allowed to attain her full period, it would, in all probability, have acquired such a magnitude as to preclude the possibility of extirpation. I requested the opinion of my father and Mr. Luke, who coincided with me as to the character of the disease,—as to the hazard of performing the operation under pregnancy, and as to the danger of allowing the full term of gestation to arrive. I, therefore, brought on premature labour about the end of seven months: she was received into the London Hospital as soon after as was safe; the tumour was removed, and she enjoyed her former health. The child presented with the breech, the labour was somewhat lingering; and it was unfortunately born dead.

† MS. Lectures, 1821.

Inflammation of the pelvic viscera.—After laborious labour, the viscera, at the lower part of the abdomen and pelvis, often go into a state of inflammation : suppuration may occur, but it is not usual; the inflammation for the most part terminates either in resolution or sloughing. This state is known by shivering, general fever, and local pain,—by a quick pulse, white tongue, thirst, heat and dryness of skin, deficient secretion of milk, and by the lochia being suppressed, or scanty and of bad odour; and there is pain on pressing the lower part of the belly. If the uterus feels large, hard, and painful, most likely the inflammation is principally confined to that viscus; but the pain being more extended, and the swelling less circumscribed, would imply that the disease is then more diffused; and there is a greater chance of its terminating in sloughing or in abscess.

Suppuration is known to have supervened by occasional rigors occurring,—by the sharpness of the pain experienced,—by the pulse increasing in rapidity, and falling in power,—and by hectic fever. The tongue becomes furred; and there is purging, and sweating, and vomiting, and wasting of the body: most usually the bad symptoms increase, and the patient dies; but sometimes the pus will be evacuated by the vagina, with almost immediate relief.

Deep collapse.—A state of deep collapse may be produced by the extensive contusions and subsequent mortification. The entire prostration of strength, the muttering delirium and watchfulness, the cold clammy extremities, the quick, weak, tremulous, and often irregular pulse, will sufficiently characterise this state ; while the purgings and vomitings, and aphthous mouth, will indicate the extent of the danger.

Sometimes the parts, rather by their own healing powers than by the aid of medicine, will become restored; the symptoms will gradually abate; the different organs will slowly regain their healthy functions; and after hovering on the brink of destruction for some weeks, by a strong effort of the constitution, the patient will unexpectedly rally. At other times the parts will slough, and various will be the extent of the destruction produced. Occasionally, the bladder, rectum, and all the coats of the vagina, will become gangrenous; the three cavities will be thrown into one; and if the patient survive, of which there will then be little chance, most wretched indeed must be the remainder of her life. At others, an aperture will be formed between the vagina and neck of the bladder, or some part of the track of the urethra, which, unless successful surgical aid be administered, will remain open till death, the urine passing *guttatim* through the vagina involuntarily. At others again a portion of the mucous membrane of the vagina only will slough; constitutional irritation, varying in degree, will supervene, which will cease on the healing process being established; a cicatrix will be formed, and this will most likely impede the passage of the child during a subsequent labour; or it may even narrow the canal to such an extent as to prevent marital intercourse.

Treatment.—Little can be done by medicine under this unfortunate condition. The parts may be fomented, and the strength must be sustained. The introduction of a piece of lint, soaked in turpentine and oil, has been recommended to facilitate the slough's separation. As soon as the patient is able to be moved, she should be sent into the country; a change from the close atmosphere of town to a more healthy air has often given a fillip to the constitution, has renovated the sinking powers, and put an immediate check to some of the worst symptoms, especially obstinate purging.

Inability to pass urine after delivery is not an infrequent consequence of lingering labour. It arises from turgescence of the vessels of the urethra and neck of the bladder, or perhaps from spasm of the sphincter.

The introduction of a catheter two or three times in the twenty-four hours is necessary in every case where the bladder does not void its contents. Occasionally it happens that, after this inability has continued a short time, the patient, for two or three days, will pass her water tolerably well; and subsequently it comes away involuntarily. Under this state, if the labour has been tedious, it is always to be suspected that a slough has taken place at the neck of the bladder, or in the track of the urethra, especially if at the same time there be a fœtid discharge, and most particularly if a small piece of membranous substance has been voided; which, on being washed, will be found to be a part of the neck of the bladder, sphacelated and separated. These suspicions may be confirmed or annulled by simply passing a catheter into the bladder, and introducing a finger into the vagina, along the course of the urethra; if any portion of the catheter can be felt naked through the vagina, a fistulous orifice has been formed, and the treatment under such circumstances must be regulated according to the common principles of surgery.

Even before any aperture is detected, we may suspect the probability of such a misfortune being about to happen, if, on the withdrawal of the catheter, after evacuating the bladder, that portion of it which has passed through the urethra be blackened or rendered of a brownish colour. The discoloration is dependent on a coating of hydrosulphuret of silver, which the instrument obtains, by the action of sulphuretted hydrogen upon the metal. This gas is evolved during the destructive process that is going on within the canal; and the effect produced upon the catheter, proves either that death of some of the structures has actually occurred, or that a strong disposition to gangrenous action exists. I have known very few instances where a slough to a greater or less extent did not follow such an indication.

Pressure on the nerves.—Occasionally the nerves suffer; the great sciatic, which lies over a part of the sacro-iliac synchondrosis, is especially exposed to pressure, unless there be a large cushion of fat in the pelvic cavity. Pressure on this nerve, under labour, produces great pain, numbness, and cramps, and sometimes a partially paralytic state after delivery. Nerves in themselves do not possess much restorative power, although usually they regain their healthy state after labour. I never knew an instance in which permanent paralysis existed as a consequence of injury done to a nerve during labour, though I have known pain, numbness, and inability to move one or both legs freely, continue for many weeks.

Tumour on the fœtal scalp.—When a child is born after lingering labour, the head having been considerably compressed, we shall usually find a circumscribed tumour on the scalp at the vertex, as depicted in Plates 48, 53, 56, and 57. Such a swelling has been often supposed to contain fluid, and I have known it proposed to be punctured, or incised, though I never saw the practice carried into effect. There is a feeling of subdued fluctuation in the tumour; but it is not a morbid growth: it proceeds entirely from the collapse of the bones, owing to the compression which they have suffered. Generally speaking these cases do very well: there is no fluid present, or merely a small quantity in the cellular texture that does not require to be let out by an operation. As the brain becomes more developed, or regains its healthy form, the bones in a few days acquire their natural position, the head its proper shape; and the tumour disappears. It is only necessary to apply an evaporating lotion to the part,—more, perhaps, for the sake of satisfying the mother, than for any decided advantage likely to be derived from its use.

PRETERNATURAL LABOUR.

Breech presentations.—Hitherto the attention has been confined to different cases of head presentation; but as there is scarcely any point of the fœtal body that may not present in labour, those cases in which any other part meets the finger than the head, have been classed, after Denman, as *preternatural labours:* of these, by far the most frequent is the presentation of one or both nates.*

Two orders.—Preternatural labours are divided into two orders; the first embracing presentations of the breech, or any part of the lower extremities; and the second, those cases in which the child offers itself transversely.†

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* Many speculative fancies have been indulged in, designed to account for the preponderance of head presentations; and gravitation has had most supporters. It was supposed that the placenta was invariably situated at the fundus uteri; and that, the fœtus being suspended by the funis umbilicalis, its head, which is the heaviest part, naturally inclined downwards; especially as in the younger embryo the umbilicus is comparatively so near to the pubes. This, however, cannot produce the influence ascribed to it; because, during at least the latter half of utero-gestation, the fœtus is not suspended by the funis, which, indeed, is too long to admit of such a possibility; —because the placenta is not always, nor indeed generally, implanted at the fundus uteri,—being sometimes even situated upon the cervix, or over the mouth of the womb itself; in which case, at no period of pregnancy would the fœtus be suspended under the upright posture of the body;—and because the funis is sometimes found coiled around one of the fœtal limbs; which accidental position must influence the depending part, even if the embryo were actually suspended. These and other facts are most forcibly adduced by Dubois, in a paper published in the third volume of the Memoirs of the Royal Academy of Medicine, page 431, to overturn the opinion that gravitation had any influence in producing the presentation of the head; and he has ascribed the general situation to an instinctive impulse implanted in the fœtus, which inclines it to take the most favourable position for its escape,—as the needle points mysteriously to the pole. But such a mode of reasoning and illustration cannot be considered either as argumentative or conclusive; it is, in fact completely evading the question, after attempting to elucidate it; and the method he has taken can only be regarded as a cloak for human ignorance. It would, in my opinion, be much better not to endeavour to explain the secrets of nature, so deeply hidden, but to content ourselves with referring this also to a general, though not invariable law,—a part of the great system which shows the design, and exemplifies the harmony, that reign throughout the whole works of Providence. M. Virey (Revue Médicale, vol. ii. 1838, p. 397), indeed, has stated, that in those pregnant animals of the multiparient kind which he has dissected, he always found in the horns of the uterus the snouts pointing to the vulva; that in a gravid viper which he opened, all the young, eight in number, were placed in the direction with their mouth towards the external parts; that, in the egg, the head is always directed to the large end, and that that end is extruded first; and that the same obtains with regard to the ova of fishes. We all know that the larvæ of insects escape with their head first,—that the chrysalis eats through its shell, and the caterpillar through its silky covering; and we see, therefore, one common law regulating the whole of nature's operations.

† The average frequency of breech presentations has been variously stated, as different tables have been taken for the guide. The returns from the *Maternité* in Paris, published by Dubois (Dictionnaire de Médecine, second edition, vol. i. p. 370), calculated from 20,517 deliveries, show one in 33—30 births. Collins (Practical Treatise on Midwifery, p. 40) gives the average of "preternatural presentations" during his mastership of seven years at the Dublin Lying-in Hospital, at one in thirty. The number of children born in this period was 16,654. The tables which I have kept of the patients of the Royal Maternity Charity in London, delivered under my own superintendence, since the year 1827 to the end of the year 1850, amounting to 48,985 cases, and 49,525 births, give an average of presentations of the pelvis or lower extremities, of one in nearly 40¼ children. The average published in the second edition of this work, calculated from 35,743 cases and 36,131 births, was about one in 39. All these, however, include twins and premature labours, in which class of cases irregular presentations are more frequent than in single births or labours at full time. See Appendix P.

A woman will frequently suspect that she is about to have a cross-birth, as it is called (for all preternatural cases, in common *parlance,* are so termed), if she has suffered any peculiar feelings under pregnancy, such as she has not experienced with any of her other children, or if she is different in her size and shape from what she had been on former occasions. But on such supposed indications we cannot place the least reliance. Inasmuch, indeed, as, in breech presentations, the child lies with the long diameter of the oval in a situation perpendicular to the trunk of the body, the general shape of the uterus will be much the same as if the head were downward; and there is not one symptom by which we are able to detect that the breech will present, previously to the commencement of labour. It might be supposed, perhaps, if the uterine parietes were unusually thin, and the woman much attenuated, that we should be able to feel the hard globular head towards the fundus; and that this might lead us to believe the case would turn out a breech presentation in labour; but any suspicions drawn from such a source must be very liable to error; for it is far from easy to distinguish the head through the thickness of the uterine and abdominal parietes, by the hand applied externally.

Causes.—Many accidental causes, which may be avoided, have been supposed to produce cross-births; such as violent exercise, the shaking of a carriage, different postures of the body, and especially that in which the hands are frequently raised above the head,—as in the case of females employed in shops. It is now, however, fully known that such circumstances influence in no degree the situation of the infant in the womb; for women who confine themselves closely to the sofa during the whole of gestation, are liable, equally with those who take active, or even violent exercise, to have their children present preternaturally. Some women, indeed, from original formation, or other at present inexplicable causes, appear particularly obnoxious to this mischance, and it has occurred to me to know many instances of such peculiarity.*

Irregular presentations are popularly believed to be more frequent among the lower than the higher classes. I have reason to think that this observation is not correct. That in the aggregate there are more cases met with among the poor than the rich is true enough; but not more than the relative numbers of the two orders would lead us to expect.

Particular position of the child.—Under a breech presentation, the child may be variously placed in utero,—with the back towards the abdominal muscles of the mother, and the face towards the spine,—with the face anteriorly, and the back towards the spine,

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* See, in confirmation, Collins, Pract. Treatise, p. 40.

—with one ilium looking towards the promontory of the sacrum, the other towards the symphysis pubis, and the face to one or other side of the mother,—and, lastly, in a diagonal direction, one ilium being situated against the sacro-iliac symphysis, the other behind the groin of the opposite side. The first-named position is the most usual, with the back towards the abdominal muscles, the face towards the spine, with the right side towards the left side of the pelvis, and the left side towards the right (Plate 61); and the fœtal body is inclined, in a slight degree, towards a diagonal position, one of the nates being a little in advance of the other; so that the child does not present itself with the anus directly over the centre of the os uteri, but a little to one side.

Progress of the labour.—When the breech presents, the labour commences exactly as it would do had the head offered itself: previously to the accession of uterine pains, the womb subsides lower in the person,—partly in consequence of the cervix uteri being received into the cavity of the pelvis, and partly in consequence of the contraction going on in the uterine volume itself. The pains at first appear weak, slow, and at long intervals; but they gradually increase both in frequency and strength. Under these contractions the os uteri dilates, the membranes protrude through it into the vagina; after an uncertain time they rupture, and the breech of the child occupies the brim.

In illustration of the passage of the child through the pelvis, I will instance the case most commonly met with; viz. where the face is looking towards the spine, and one ischium is somewhat preceding the other. The os uteri being entirely dilated, the membranes broken, and the breech entering the pelvis, it is propelled downwards with each pain, and recedes a little in the interval, till it comes to press on the outlet of the pelvis. Now, inasmuch as the greatest width of the breech is from side to side, it is evident that the fœtus has already adapted itself to the capacity of the pelvic brim, in the situation most favourable for its entrance into the cavity; but when it presses on the outlet, its long diameter is opposed to the short diameter of the outlet; and in this situation a slight turn is effected:—though not so complete, perhaps, as the head takes under a natural presentation;—one of the ilia gliding along the concavity of the sacrum, and the other appearing under the arch of the pubes. In this way it is propelled, distending the perineum considerably, till the breech is entirely in the world. (Plate 62.) The legs pass doubled, with the toes up towards the chest, and when they are expelled as far as the knees, they are usually thrown out of the vagina by the action of its fibres. While the body of the fœtus is thus passing through the outlet of the pelvis, after the turn is effected, the shoulders are entering the brim, either with their long diameter in the direction of the lateral diameter of the brim, or a little diagonally. As the fœtal body traverses the cavity, the hands are slipped up towards the head, so that the axillæ and the inner surface of the arms come into direct contact with the mother's structures. The pains continuing, and the fœtus being propelled lower, the axillæ come to press against the interior surface of the ischia: another turn is then effected; by means of which, one peeps up under the arch of the pubes, and the other is directed along the sacral cavity and the perineum. Here, again, the shoulders are thrown into the best possible position for their escape, and, at the same time, the head is entering the brim in the most favourable situation for its transit; but on arriving at the outlet, the chin hitching on the internal surface of one ischium, the occiput on the other, the greatest diameter of the head is in the direction of the shortest diameter of the outlet; and it is as impossible that it can pass without being changed in situation, as it would be while the face looked to either ischium under an original presentation of the vertex. It is necessary, therefore, that a third turn should take place; and this, like the previous turns, is accomplished by the expulsive action of the uterus above being resisted by the formation of the bones below.—The face is thrown into the hollow of the sacrum, the occiput under the arch of the pubes, and the head is expelled with the face sweeping the perineum. Usually, the arms remain by the side of the head until the child is quite born, if no assistance be rendered.

The case next in frequency is, where the face looks anteriorly, and the back towards the spine. The same effect is produced by the expulsive efforts as in the former. The breech descends to the outlet of the pelvis, receding and advancing alternately as the pains return and intermit; a slight turn is effected; one of the ilia appears under the arch of the pubes, the other traverses the perineum; the breech and legs are born; the shoulders pass the brim, and descend until they press upon the structures at the outlet; one of the axillæ is then directed under the arch of the pubes, the other follows the curve of the sacrum, and the head is propelled into the cavity of the pelvis, with the face looking to one side and the occiput to the other. It might, *à priori*, be supposed that, as the face was originally lying towards the abdominal muscles of the mother, the occiput would be expelled along the hollow of the sacrum, and the face emerge anteriorly; but this is not the case; for when the shoulders are external and the head is in the pelvis, the face is directed to one side or the other, exactly as when the child presents with the face towards the spine in the first instance; and a precisely similar turn is effected, the face being directed backwards; so that the fœtus, in its transit, makes a semicircular rotation, the face being placed

forwards at the commencement of labour, and being expelle through the outlet traversing the sacrum and perineum. believe that in no instance, if the case were left entirely to natur —provided the child and pelvis were of common size and form— would the face be expelled under the arch of the pubes.

If the breech is offering itself diagonally, exactly the sam occurrences take place as I have just described; for the pelvis i almost, if not quite, as wide from the sacro-iliac synchondrosi to the opposite groin, as from side to side. But when the child' abdomen is directed to one ilium, and the back towards the other the long diameter of the breech is in the direction of the shor diameter of the pelvic brim,—and the probability is that it woul not pass with the same ease as in either of the former cases; bu that it would be turned a little to one side before it entered th cavity. The changes in position just adverted to would then tak place, and expulsion would be accomplished in the same way as i it offered in the more usual direction of breech presentations.

Breech presentations with feet.—It is, however, not only breec presentations that form the first order of preternatural labours one or both feet may present (Plate 63), or a foot and the breec together, or both feet and the breech, or a knee and a foot (Plat 64), or both knees. Thus even this apparently simple order preternatural cases admits of a great variety.

It is evident that there will not be more difficulty when th knees present, than in a breech presentation—probably not s much; because the parts are expanded more gradually, the bod of the child forming more of a cone. But although it is, perhaps not so painful a labour as when the legs are doubled up toward the abdomen, still it is more dangerous to the child, since ther must be more pressure on the funis umbilicalis when the uppe part of the body, or the head is passing, in consequence of th parts not having been so completely opened as if the breech ha previously escaped with the thighs bent upwards.

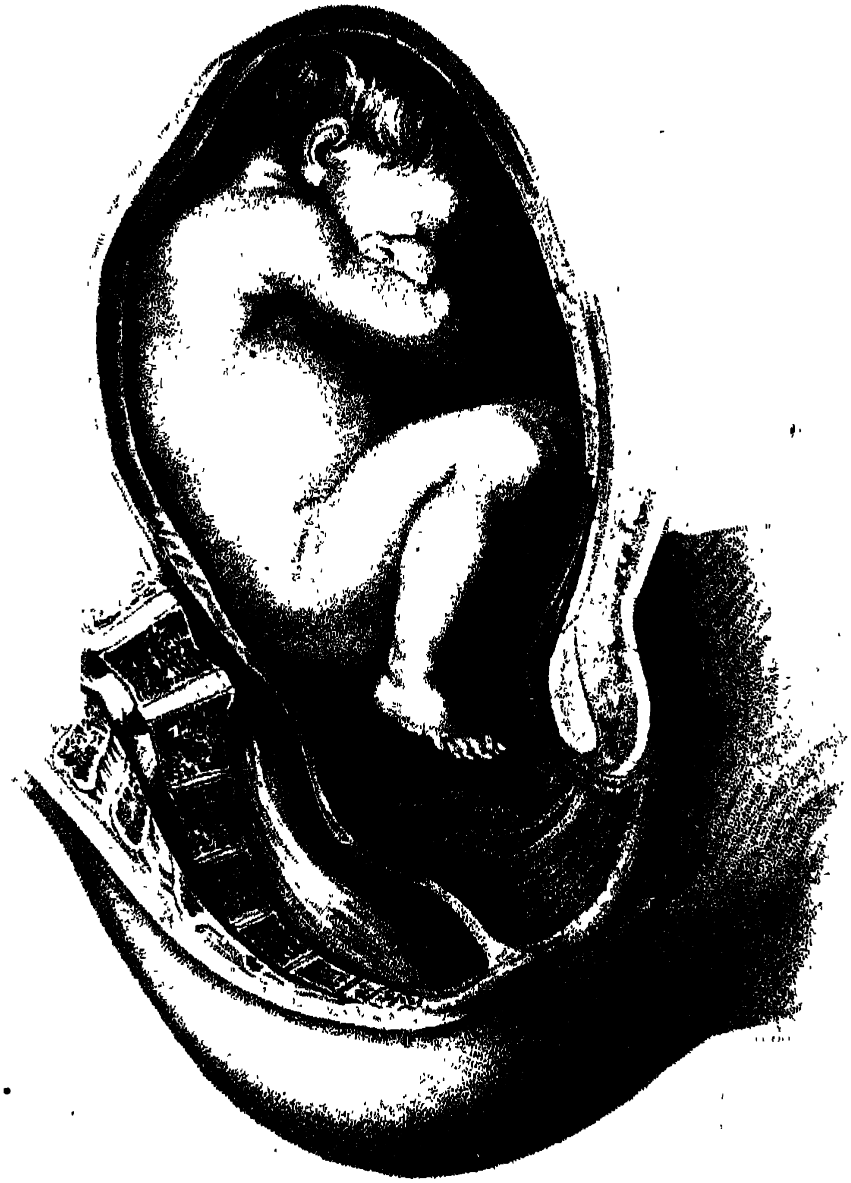
If the breech and one or both feet should present, which is b no means unusual, more space would be occupied, and mor time would generally be taken up, than if the breech presente singly; but still the same action would go on, and the sam effect would be produced, provided the pelvis were sufficientl large. One foot, or perhaps both, would be protruded externall before the breech, the same turns would be effected, and th labour would most likely be completed by nature, without th necessity of any extraordinary assistance being applied.

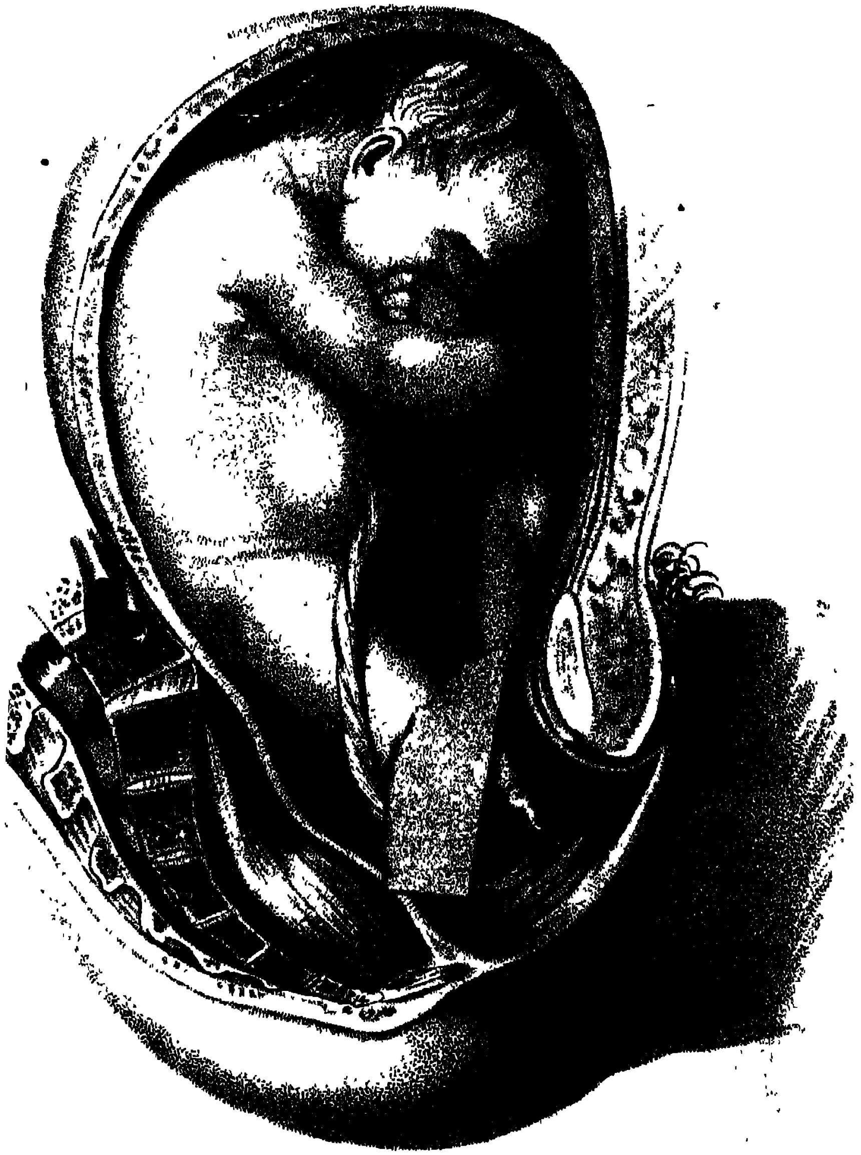
Conduct under breech presentation.—In cases of breech preser tation a great deal more attention is required of the obstetricia than under a natural labour, as well for the protection of th woman's parts, as for the preservation of the child's life; for th infant is always placed in greater or less jeopardy from the compression which the funis umbilicalis must suffer, during the passage of the shoulders and the head. More care is requisite also to prevent injury to the woman's structures; because, in natural labour, when the head is born,—since that possesses the largest circumference of any portion of the fœtal body,—the passages are generally distended by it to such a degree as to permit the easy transit of the other parts. But when the breech comes first, being smaller in diameter than the shoulders, it only causes a partial dilatation; the shoulders pressing upon the same structures subsequently, distend them still more, and at last the head, which is the largest body, has still farther to open them; so that they are subjected to gradually increasing pressure as the different parts of the child's person progressively emerge, one after the other; and it is therefore necessary for us to continue our support to the perineum until the infant is entirely in the world. In natural labour, however, we need only protect these structures while the head and shoulders are making their escape.

The first duty we have to perform, is to ascertain the presentation; and it is a matter of the greatest possible consequence that we should detect a breech case early in the labour, lest we should confound it with the head, and more particularly with the shoulder; for there are many points of resemblance between the breech and both these parts; and,—while a breech case requires comparatively little assistance,—under a shoulder presentation, the performance of an operation both difficult and dangerous becomes necessary to accomplish delivery.

No indication authorising a supposition that the breech presents, can be gathered from the mode in which the membranes protrude into the vagina, which is usually,—as when the head offers,—in the form of the large end of an egg. But the breech may be discriminated from the head and other parts, as soon as it can be felt, by some marks both positive and negative; and I shall now only point out the diagnostic marks with reference to the head, reserving those connected with the shoulder for future consideration. The breech is not so round, nor so hard, nor so strongly ossified as the head:—it is not divided into compartments by sutures and fontanelles; on the contrary, it possesses two hemispheres: it is more fleshy, softer to the finger, and is not so resistant to the touch; we may most probably also detect the chink between the thighs, the organs of generation, and the anus. If we have fully ascertained the existence of these negative and positive marks, and especially if we have detected the organs of generation, male or female, and the anus, it is impossible that we can mistake the breech for the head.

These points must be determined previously to the rupture of





the membranes; and our examination must be made with the greatest care, and in the interval of uterine contraction, lest we should let off the liquor amnii; for in the case we are considering, it is even of greater importance to preserve the cyst entire, than if it were a head presentation. When we first make an examination, if the nates be the most depending part, and we ascertain that there is not that characteristic feel which the head supplies, we may be in doubt as to whether the shoulder or breech be at the brim. If so, we should pass two fingers of the left hand, during the absence of pain, into the pelvis, up to the brim, within the os uteri; and it is seldom that we cannot, in this way, gain the information we seek.

Having, then, positively detected the breech, there is no necessity for alarm,—we are not to suppose that the woman will be endangered;—we must not manifest, in our manner, either agitation or anxiety;—and we must be particularly cautious not to let the patient hear the word "cross-birth" whispered in her chamber; because she will certainly be more or less excited, and such a shock might be suddenly impressed as to suspend labour, and retard it for a number of hours. We may, then, endeavour to evade her anxious question, *whether everything is right*, by assuring her of her perfect safety. At the same time, it is desirable that her friends should be informed that the case is one of the simplest kind of *cross-births;* that most probably no operation will be required, but that there is a considerable chance—especially if it be a first labour—that the child will not be born alive. If in this first examination we are quite satisfied that the breech presents, but are not able to detect whether the abdomen of the child is situated backwards or forwards, it is neither necessary nor proper that we should be constantly making examinations for the purpose of ascertaining this point. It is right that we should be a little more assiduous in our attention to the patient than if the head presents, but not so officious as to alarm her; and it is quite requisite that we should not absent ourselves from the house. We may occasionally institute an examination, in the absence of pain, to watch the progress of the dilatation of the os uteri, and the descent of the membranes, but we must be most careful not to break them, although they should appear externally; waiting, even then, within proper limits, for their spontaneous rupture.

The membranes having given way, and the breech fully occupying the pelvic cavity, we must apply our hand, guarded by a napkin,—in the same way as when the head presents,—over the perineum, and support it until the breech and legs are in the world; and as soon as the umbilicus has appeared externally, we must bring down a fold,* in order to prevent the vessels of the funis from being stretched. It has been shown that the umbilical arteries run in a twisted direction around the vein, and it is a necessary consequence that a compression of their cavities, and a diminution in their calibre, would take place quite as easily from a tightening of the cord, as from actual pressure being applied to it. We cannot prevent the direct compression which the funis must suffer between the child's head and the pelvic bones, but we can prevent tension, by bringing down a portion as a loop; and it is very possible, if we neglected this precaution, that, as the body was being expelled, the cord would be so stretched as to impede the circulation, and destroy the infant's life.

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* See Plate 65.

When the shoulders are about to pass, it is our duty to take care that they offer themselves in that position most favourable for their exit; and if they do not, to turn one under the arch of the pubes, and the other into the hollow of the sacrum; and this is doubly requisite, not only for the easy transit of the arms themselves, but for the purpose of placing the head in the most favourable position for its passage through the brim. The arms being brought down, we may direct the head into the most easy situation for its escape, taking advantage of the expulsive action of the uterus to aid our gentle endeavours. When the head is fully occupying the pelvis, the chin being within one ilium, and the occiput within the other, we may with great advantage facilitate the turn of the face into the hollow of the sacrum, by placing the right hand on the back of the child, and the left on the abdomen; the two first fingers of the right hand forming a crutch around the neck. We may then support the perineum with the left hand; as the head is passing, we may turn the nape of the neck up under the symphysis pubis, as on a pivot; bring the back towards the mons veneris; and thus assist the birth, not by drawing the child's head forcibly out, but merely guiding and receiving it as it is expelled by the action of the uterine and vaginal fibres.*

The child being born, our duties are exactly those appertaining

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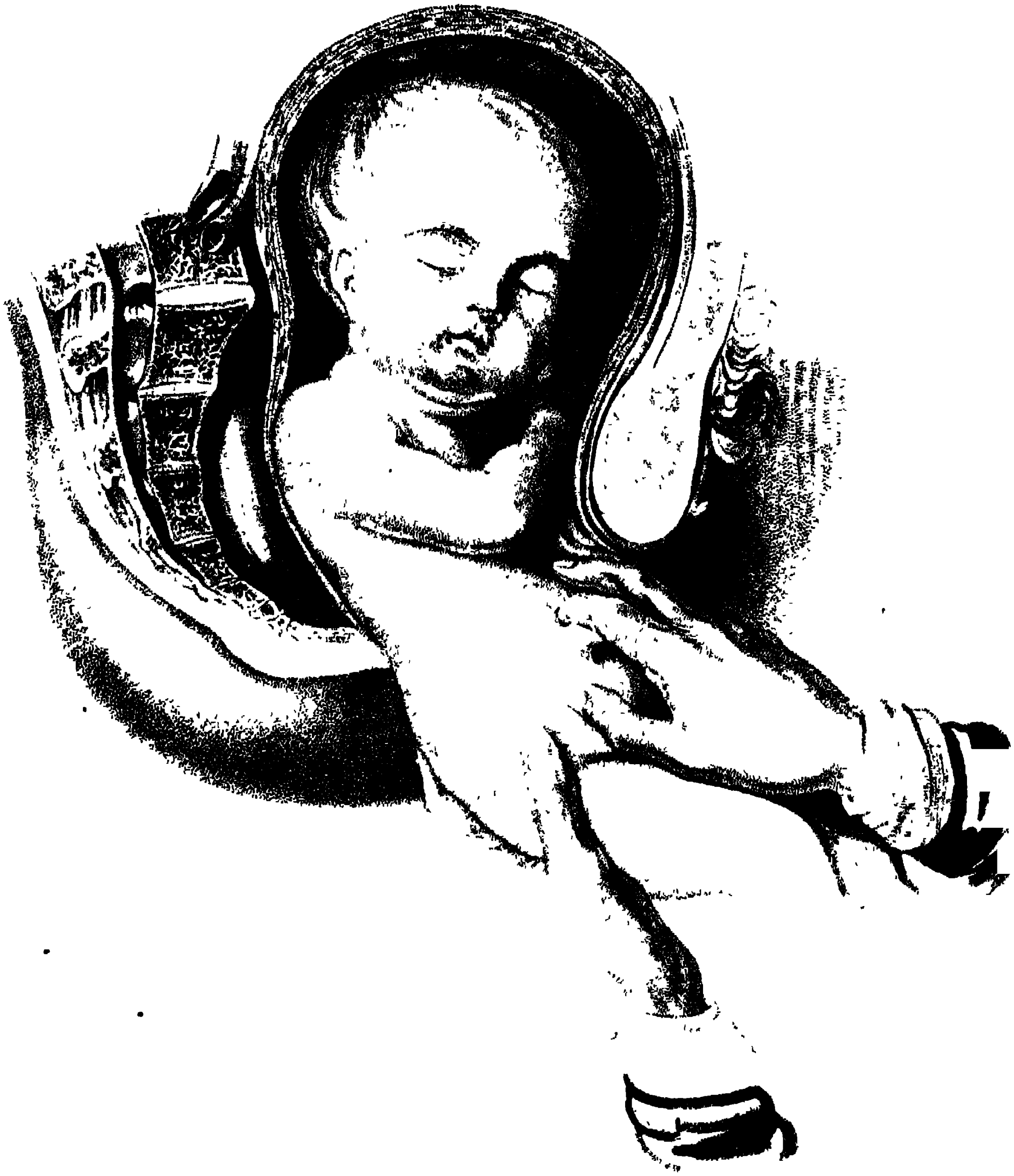
* I have been called upon to extract the head in many cases, where it was supposed that the pelvis was distorted or the head preternaturally large, merely because the previous attendant had not been mindful of causing the head to pass through the brim with its long diameter in the direction of the long diameter of the brim, but had brought the child down with the face backwards, so that the forehead impinged on the prominence of the sacrum, as shown in Plate 66, or forwards against the symphysis pubis: such an accident, besides entailing much additional pain on the mother, is almost certainly followed by the infant's death, from the pressure to which the cord must be exposed. It may be prevented by paying due regard that the face passes through the brim towards one or other ilium; and may be remedied, when it has taken place, by turning it in the same direction. Placing the head in the most favourable position for its passage through the brim, is one of the most important points in the management of a breech case; but it is, of all the duties appertaining to such a case, perhaps, the one most frequently neglected.



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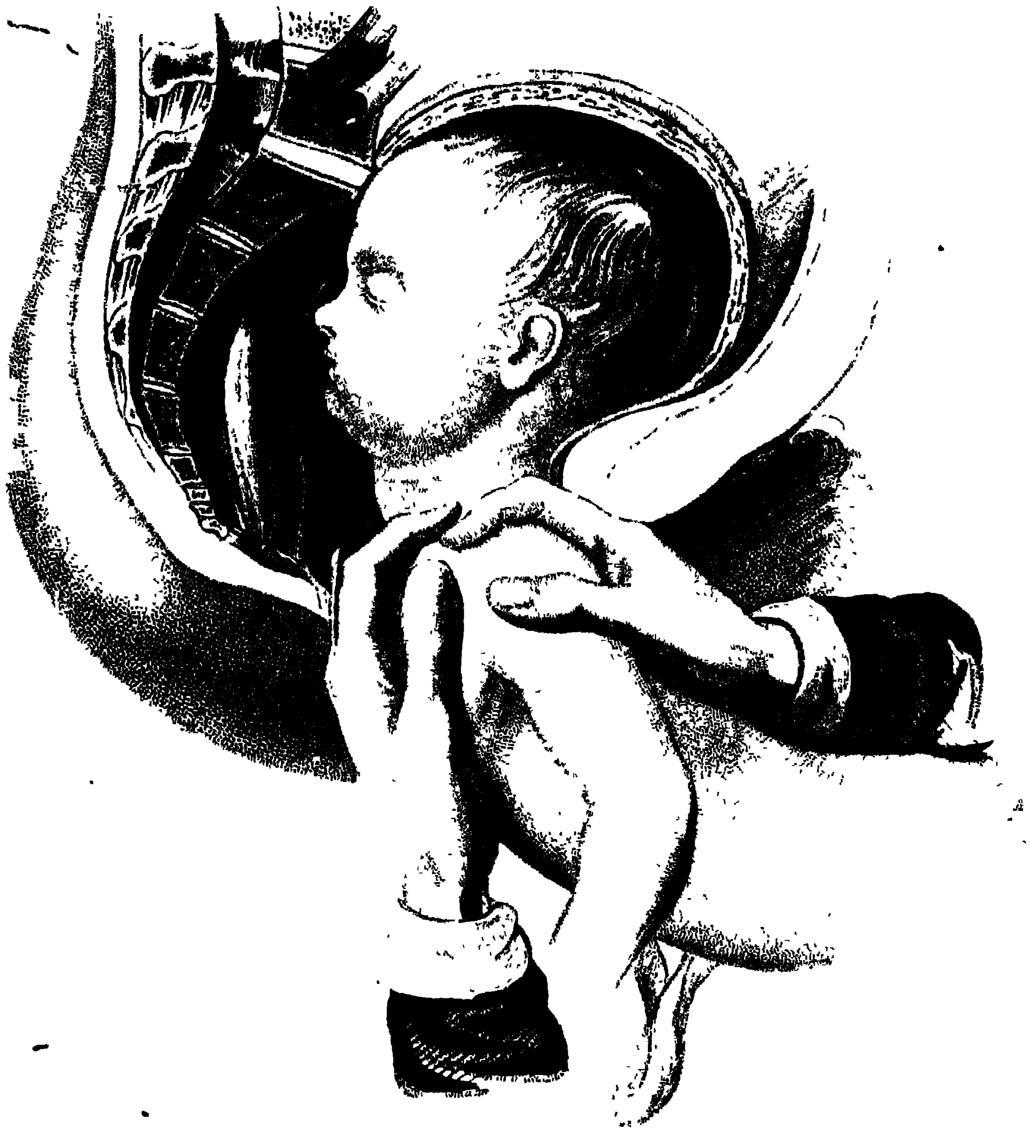

to common labour; we must wipe its face, take care that it does not inhale any of the mucus that may hang about its mouth, separate it as before described, dispose of it to the nurse or some other party, and then make an examination of the uterine tumour. In all cases of breech presentation, it is right that a warm bath and other resuscitating means should be in readiness, and close at hand, in order that the best chance should be afforded of restoring the child, provided animation be suspended.

It used to be the custom, and it is still practised by some, to make traction as soon as the breech is in the pelvis, and before the nates appear externally, by hooking the finger first in one groin, and then in the other, and thus to bring down the legs, so that the feet might pass externally as early as possible. Dr. William Hunter at one time recommended this practice, and he was by no means a meddlesome obstetrician. The object of the recommendation was to save the patient pain. It was argued, Why should we suffer the woman's structures to be so much distended by the doubled breech, when we have it in our power easily to relieve them of the tension, by bringing down the feet, and allowing them to be expanded more gradually? and it certainly was both a very plausible argument, as well as natural conclusion. But the result of this practice is to place the child's life in imminent hazard: as long as the legs are turned up towards the belly, so long that portion of the funis near the child's body may possibly be protected by the triangular space formed between the two thighs and the abdomen; and thus a certain degree of security may be obtained. Again, when the breech has been expelled doubled, it has prepared the way for the exit of the shoulders and head much more completely than when it has passed with the feet foremost. The woman's structures must be subjected to a definite degree of distension during the passage of the head; and the extent to which that distension is carried is not influenced at all by the mode in which the breech has pa[illegible]d the pelvic apertures. Is it not better, then, that she should suffer the pain which cannot be prevented, at first, with the chance of saving the child's life, than undergo it afterwards, when there is a much greater probability of its being born dead? Dr. Hunter, indeed, soon saw the danger of interfering in the manner he first adopted; and he was accustomed to say in his lectures, that when he used to extract the legs before the breech, he lost almost every child; but when he changed his mode of practice, and let the breech pass doubled, and did not allow the legs to escape until after the knees were born, he was much more fortunate i[illegible]aving the children;* and the same result has been noticed by subsequent observers. When the body is expelled, indeed, and the arms still remain within the pelvis, our active assistance becomes not only useful, but almost necessary: we may then endeavour to relieve the parts from distension, by bringing the arms cautiously down, for their presence in the vagina can be of no service; they cannot preserve the funis umbilicalis from pressure;—nay, they are actually doing harm, for they take up room, prevent the easy descent of the head, and may perhaps themselves press upon the cord. But in attempting to bring down the arms, our efforts must be most gentle; and we must be very careful to direct the limbs forwards, so that the hands should sweep over the child's face. If we were to turn them backwards, we must necessarily break or dislocate the humerus—an accident that might most easily happen, from the imperfectly ossified state of the bones. That arm placed behind the symphysis pubis must be brought down first; and this it is in general not difficult to accomplish, by sliding one or two fingers perfectly over the shoulder, carrying them a little way along the humerus, and carefully directing the fore-arm anteriorly: this being effected, we may bring the child's body forward, so that the side of the neck should be applied closely under the symphysis pubis, introduce two fingers of the left hand back towards the sacrum, and in the same tender manner extract the other arm. (Plate 67.)*

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* See Merriman's Synopsis, p. 71; note of Dr. Hunter's MS. Lectures.

The parts being now relieved from tension, the head pressing somewhat on the outlet of the pelvis, we may favour the inclination of the face into the hollow of the sacrum by the means just recommended; and if there be any difficulty in so doing, we may pass a finger into the mouth of the child (Plate 68), depress the chin, and give the head the requisite turn. Let us not, however, forget the delicate structures on which we are operating: let us remember that the bones are not strong and solid, but are easily broken; that there is a symphysis in the centre of the jaw; that we may either dislocat[illegible]he articulation, separate the symphysis, or break the bone itself. Every practitioner is aware how tenderly conducted should be the examination of an infant's body after birth; and quite as gentle should be our attempts to relieve it during labour.

Under a breech presentation, after [illegible]mnii has been

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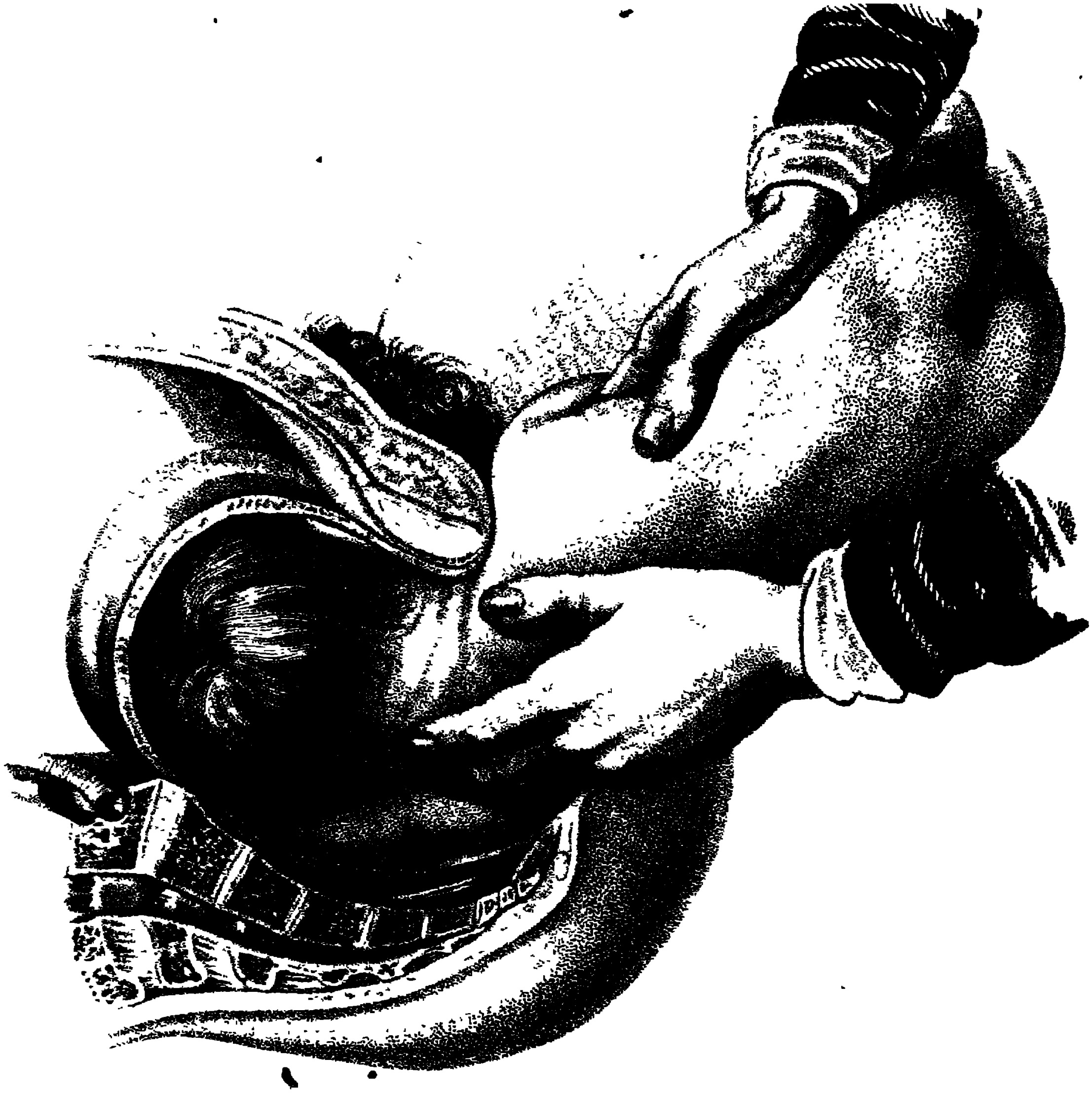
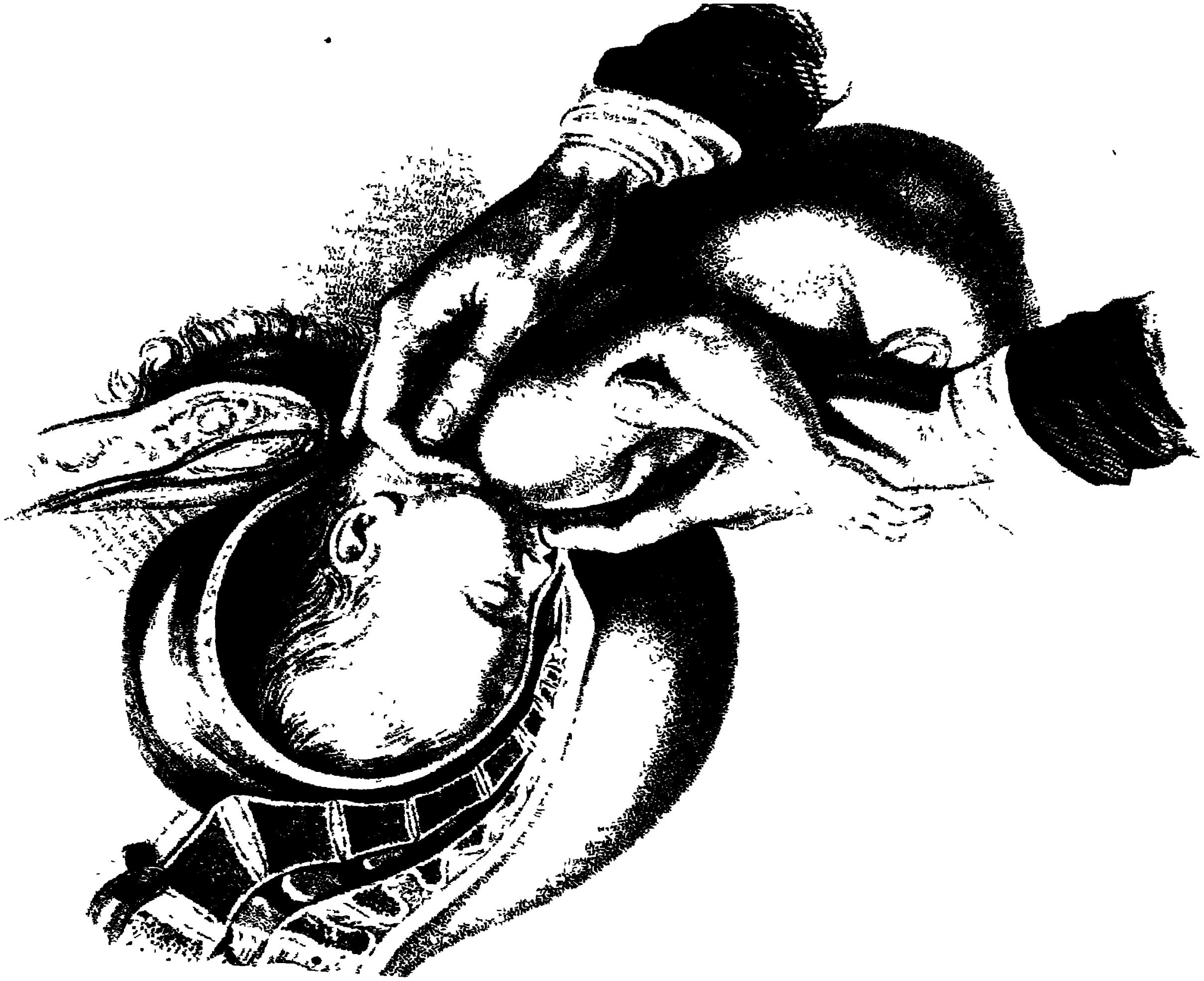
* Denman, chap. xiv. sec. 3, says:—"It has been esteemed by some a very injudicious practice to bring down the arms of the child; these being turned along the head, preventing, in their opinion, that contraction of the os uteri round the neck of the child, which would be an impediment to its complete deliverance." Such fears are merely hypothetical. I never [illegible]ew the occurrence dreaded take place so as to retard the child's passage. When the undilated state of the uterine mouth offers much impediment to the birth after the body is born, it is by girding the *upper* pa of the head just above the nasal bones, as is well described by Merriman, Synopsis, p. 76.





evacuated, the meconium is frequently, but by no means invariably, squeezed out of the rectum, by the mechanical pressure sustained. This circumstance has therefore been noted as a symptom of breech presentation. It is dangerous to rely on this occurrence for an indication; both because it is not universal in breech presentations, and also because it may take place under other positions of the fœtus. Besides, it cannot appear until after the rupture of the membranous cyst; and it is far better and safer to trust to the knowledge gained by a minute examination of all those points of the fœtal body which can be embraced by the finger, than to any accidental sign.

KNEE PRESENTATIONS

next come under consideration. I will suppose that the child is at the brim of the pelvis; that the labour in the first instance is going on pretty well—much the same as if the head or breech presented. The os uteri opens, the membranous bag somewhat protrudes—perhaps in the form of the finger of a glove, instead of assuming that of an egg; but this is not always the case. Upon making our examination at the commencement of labour, we detect a small round substance, with a flattened surface, possessing the characteristics neither of the head nor the breech. We are then quite sure that neither of these parts presents; but we may not be so certain whether it be a leg or an arm that meets our finger.*

If one or both knees offer, the case will usually be terminated by the natural efforts; but if it be an elbow presentation, under which the child lies transversely, we must change its position before delivery can be effected. It therefore becomes a matter of the greatest consequence, that we should discriminate between the patella and olecranon; and I shall mention the distinctive marks when on the subject of transverse presentations. Should the finger come into contact with two limbs doubled, indeed, we may feel certain that the case belongs to that order of preternatural presentations which we are now considering; for it is impossible for both elbows to protrude into the vagina at the same time.

The knees will descend into the pelvis; and the legs will drop out of the vagina, earlier than if the thighs had been bent up towards the abdomen; the breech will be expelled; the funis umbilicalis will have lost its protection; and the infant will be in great danger of perishing.

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* Plate 64 shows a knee and foot presenting, and a fold of the funis prolapsed.

FOOTLING PRESENTATION.

Again, one or both feet may present, the breech being easily distinguishable by the finger, or lying perfectly out of the reach of a common examination. (Plate 63.)

When we feel the digital extremity of the limb,—since there is no part of the child's body but the hand with which it can possibly be confounded,—it becomes our duty to discriminate between the two, for reasons previously more than once inculcated; and this we can almost always do even before the membranes rupture. The foot is known by the rounded instep, by the prominent heel, by the toes being all in one line, and by no one of the digits being an opponent to the others. When the hand is at the pelvic brim,—as I shall hereafter state,—we feel the flattened wrist and palm, the thumb an opponent to the fingers, the fingers of different lengths, and the absence of the marks just described.

Under presentation of the feet, the labour is usually rather lingering, and the dilatation of the passages goes on but slowly; nevertheless, this forms no excuse for hurry or interference: we must wait a moderate time for the descent of the child, and allow Nature to accomplish her intention unaided; unless, indeed, there be danger, or some urgent reason be present for accelerating the labour. Should two or three hours have elapsed since the rupture of the membranes, or should any alarming symptoms supervene, we must take one foot, or both, between two fingers of the left hand, and, by a little traction, bring down the legs; we have then made the case one of the most simple of preternatural labours.

Circumstances requiring assistance under a breech presentation.—Many accidents may happen during the progress of labour under a breech presentation, independently of exhaustion from a long continuance of painful efforts, which will require that delivery should be accelerated; and some of these originate in the mother's system, others in the child's. Thus hæmorrhage, convulsions, or syncope, may induce us to terminate the labour; and delivery is generally more easily accomplished than when the head presents; for we are then compelled either to introduce the hand into the uterus, and change the position of the fœtus, or to apply the forceps, or use the perforator, if that dreadful instrument be required to save the mother; but when the breech or feet present, we have merely to make traction by the leg, provided it be easily brought down, or by surrounding the groin with a finger or blunt hook,—as will be more particularly described subsequently.

Danger to the child's life would also induce us to expedite the termination of the labour.

We are not likely to ascertain that the child is in jeopardy until after the breech is expelled; but, when the body is half born, our indication may be taken partly from the state of pulsation in the cord, and partly from a futile attempt at respiration being made while the head still remains either in the uterus or vagina. I have already directed that, as soon as the umbilicus has appeared externally, a loop of the funis should be brought down, to prevent tension on its vessels; and, at the same time, an observation may be made on the rapidity and strength of the fœtal circulation. If the arteries of the funis are beating freely, firmly, and equably, about one hundred strokes in a minute, the child is in no present danger, and we need not accelerate the labour for its sake; for by so acting we might leave the uterus uncontracted, and occasion an attack of hæmorrhage. But if, on the contrary, the circulation be languid; or if the beats be very rapid, small, feeble, tremulous, or intermittent, some impediment exists to the transmission of the blood through the cord, and the child's life is in imminent hazard.

The other indication implying danger to the child, is an abortive attempt at breathing before the head is in the world; and this is known by a sudden spasm of the diaphragm and abdominal muscles, repeated at uncertain intervals. It would appear almost incredible that the infant should endeavour to respire while the face is closely embraced by the maternal structures, and when it can inhale nothing but the uterine discharges: such, however, I have witnessed on numerous occasions. This convulsive effort is never observed so long as the circulation along the funis is carried on with vigour; because, while the child's wants can be supplied through the medium of the placenta, there is no necessity for calling forth the hitherto dormant function of the lungs; but when that source is cut off, a fresh action is requisite for the continuance of life. This gasp, then, is indicative of danger, and, together with a declining state in the power of the circulation through the umbilical vessels, would induce us to expedite the delivery, lest the fœtus should perish *in transitu*.*

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* Meigs (Treatise on Obstetrics, p. 405), instructs that we should "endeavour to preserve the child from suffocation by passing two fingers upwards, until they reach the two maxillary bones, and cover the nose; by doing this," he says, "the backs of the fingers, pressing the perineum backwards, serve to keep an open communication with the air, and the child can breathe very well. I have kept," he continues, "a child alive in this way, breathing, and sometimes crying, for twenty or twenty-five minutes before the birth of the head." Dr. Meigs has been much more successful in establishing respiration, under such circumstances, than I have: and so difficult have I found it to keep up "an open communication" between the child's lungs and the external atmosphere, that I have always thought it necessary

In using our extractive means, however, we must ever remember the sensibility of the mother's organs, and the delicacy of the fœtal body. Violence may do irreparable injury; and great exertion even, in the case under consideration, is inadmissible.

DIFFICULT BREECH PRESENTATIONS.

Having become acquainted with the mechanism of head and breech presentations, and the difficulties that are sometimes met with under natural labour, the student may readily suppose that delays will also occur, and that impediments will exist to the easy passage of the fœtus, when the nates, or any part of the lower extremities, offer themselves at the pelvic brim.

All the causes referable to the mother, which have been before described as producing delay under natural labour, may equally occasion difficulty when the breech presents; and these may be included in one of the two general heads—either inefficiency of the propelling powers, or diminution of space in the passages.

Inefficient uterine action.—It is very generally remarked that, under breech presentations, the uterus, for some time after the rupture of the membranes, acts more feebly than in natural labour; and this is perhaps owing to the breech producing less pressure or irritation upon the os uteri than the harder head would do: but the contractions presently become sufficiently strong; and when the pelvic cavity is pretty well occupied by the fœtal body, and the perineum somewhat on the stretch, the pains are fully as powerful as when the head is passing. Such cases, then, require no artificial assistance; nor is it necessary or desirable to stimulate the uterus to increased action. But should the patient have been debilitated by previous disease, worn down by excessive discharges, be of relaxed fibre, or have borne a great many children, we may anticipate a necessity for some extraordinary aid. Should then, this sluggishness on the part of the propelling powers continue, while at the same time the pelvis possesses sufficient capacity, and the soft structures have acquired a due degree of relaxation and distensibility, it is right that we should endeavour, by the means already mentioned,* to increase the tone of the uterus, and supersede the necessity for manual interference;—such are warm diluents, taken internally; gentle friction, with slight pressure over the abdomen; change of posture; and—should the arterial system also be acting with diminished energy—we may have recourse to stimuli. The ergot

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to resort to speedy extraction, whenever I have remarked the disposition to breathe that I have noticed in the text as an evidence of danger on the child's part.

* Page 206, *et seq.*

of rye, as a general rule, is perhaps inadmissible; but if it be exhibited, the cautions before noted must not be lost sight of.

Presuming, then, the case under treatment is one in which such circumstances obtain as I have just specified, and the means recommended have not the desired effect, it next becomes a question whether we are warranted in resorting to delivery by art. To answer this question, many circumstances must be taken into consideration, which have been before sufficiently dwelt on; but since artificial delivery under a breech presentation is for the most part easier than when the head offers, it may be allowable, and perhaps advisable, to use the means we are in possession of rather earlier than if the presentation were natural; provided, indeed, no risk would be incurred of injuring the maternal structures. The method to be adopted will depend much on the situation of the breech: if it be somewhat low in the pelvis, our finger will in most instances be sufficient for the purpose; by hooking it over the groin, and the application of a little traction, we may probably bring the breech to press upon the perineum: we shall then most likely find that uterine action is increased in proportion as the perineum becomes distended; and that no further extractive aid is required. But should the breech be so high that we are unable to insinuate our finger round the thigh, so as to give us the requisite command, we may, by another very simple means, produce a most valuable and useful purchase: the extremity of a silk or cambric handkerchief may be worked over the groin, without any great difficulty; by drawing down the end of which a loop is formed round the fœtal limb, and a most powerful hold is obtained. If the handkerchief be used carefully and tenderly, it is preferable to an iron hook; but should the application of the handkerchief be difficult or impracticable, we possess an instrument,—more efficient, perhaps, but more dangerous,—in the blunt hook,—to be employed only as a last resource. If the breech have entered in any degree into the cavity of the pelvis, we can generally succeed in encompassing one or other limb by a common-sized hook. Having, then, warmed and greased the instrument, we carry its handle up towards the abdomen, introduce its point within the vagina, and insinuate it over the bend of one thigh, directing it by the first finger of the left hand, previously passed round the groin; gentle traction must then be made in the direction towards the coccyx, and we shall most probably cause the fœtal body to descend.* In making use of the purchase we thus obtain, we must not lose sight of the delicacy of the child's structures, and the imperfectly ossified state of the bones; and we must bear vividly in our mind the remembrance of the grievous injuries we may, without caution, inflict upon its person.

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* Plate 69 shows the blunt hook, applied over the thigh, the second finger of the left hand guarding its point.

In the cases now under consideration, as well as those of impaction of the breech, we have been recommended by some practitioners* to adapt the forceps over each ilium of the child—if the os uteri be dilated—and to extract by a movement similar to that used when they are applied upon the head;† there are, however, numerous objections to this mode of proceeding. The instrument not being made for the breech, but for a more globular body, does not fit that part, and is liable to slip, to the great hazard of the mother's structures. The only way, indeed, by which we can cause the blades to keep their hold at all, is by squeezing the handles firmly together, so that the points may take a deep nip upon the fœtal body; and the youngest student in anatomy would at once call to memory important organs likely to suffer severely from this rude pressure. The fœtal pelvis might be broken; and that would be an accident of no trifling importance. We may also do irreparable injury to some of the soft parts. The liver, from its large size in the fœtus, occupying as it does the chief part of the abdomen, with its edge descending nearly to the pelvic brim, is much exposed to be bruised or ruptured; and this injury is the more likely to happen, in consequence of its high vascularity, and the tenderness of its substance: nor are the intestines altogether secure from the chance of being wounded. For such reasons, then, I consider the forceps inapplicable to cases of breech presentation; and, if assistance be required, would infinitely prefer either of the three methods above recommended.

DISTORTION OF THE PELVIS.—Supposing, however, that the protraction is caused by a want of room in the bony pelvis, and that the diminution of space is at the brim, in the conjugate diameter,—where, indeed, we usually meet with it,—such a case must of necessity be difficult in proportion as the pelvis is contracted; and we shall sometimes, as in head presentations, find that difficulty almost insurmountable.

Our first duty, under such a state of things, is to detect the cause of delay; and we can have little difficulty in determining this point; for the uterus would most likely be acting sufficiently strongly to propel the breech through the brim, if there were space enough to admit it; and we can positively measure the dimensions of the pelvis as easily as though the head presented, and by the same means. The only question is as to the space necessary for the transmission of the breech. Now, this part of

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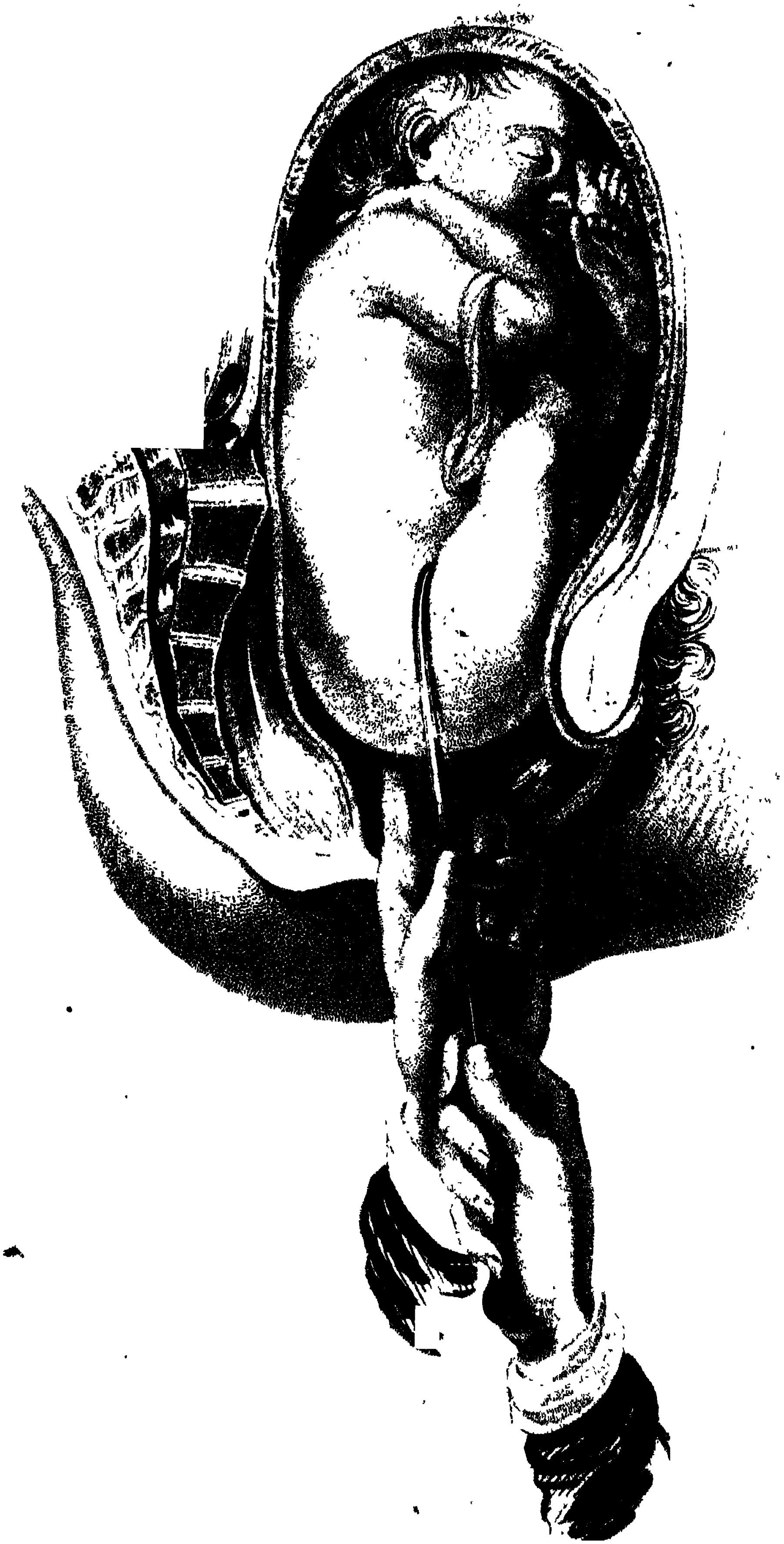
* Hamilton, Practical Observations, 1840, p. 298.

† We read in Baudelocque (parag. 1251, translation), that this mode of delivery was first accomplished by a practitioner who mistook the breech for the head, adapted the forceps, and afterwards boasted of his novel success.



the fœtal body does not possess a circumference so large as the head, and, being softer, it is more compressible; so that it may be squeezed through a smaller aperture than the cranium, while whole, would require: at the same time, however, since it possesses no cavity which can be opened, and no contents which can be evacuated, it is impossible to draw it through so small a pelvis as the mutilated and collapsed skull. If, indeed, the pelvis measure but two inches and a half from pubes to sacrum, I am persuaded the double breech may, by management, be made to pass, and that it could be extracted through a considerably less space, provided the legs were first brought down.

But, even if we succeed with the breech, a larger space is required for the shoulders; and if they pass, still there is more room necessary for the passage of the head: so that we have difficulty following difficulty, and each of them greater than the one preceding. This, indeed, is just the reverse of what happens under a head presentation; for, generally speaking, when the head is born, the body can be extracted with comparative ease.

Being, then, fully satisfied that the breech presents; having learned that the pelvis is malformed or small, the woman having been some hours in uninterrupted labour; perceiving that there is a chance of her sinking under her continued struggles, unless she be assisted,—we are fully warranted in offering relief by the means I have already stated. It is not, indeed, necessary to wait until the os uteri is entirely dilated, because the breech may be extracted through the pelvic brim before full dilatation has taken place, provided the organ be soft and distensible. It is our duty, in all instances, to endeavour to extract the child without injury to its person; but should the diminution of space be great, we can scarcely expect that it will pass alive; because if it be at the full time, and well ossified, we shall most likely be obliged to evacuate its brain before the head can be born. Notwithstanding this probability, since in the particular case under treatment it may be smaller and less ossified than usual, we must be most careful to prevent injuring its limbs, by the efforts we make for its liberation.

A gentle swaying motion from side to side will facilitate the escape of the body, after the passage of the breech, which being born, one shoulder must be turned into the hollow of the sacrum, and the other brought underneath the pubes. The arms must be extracted in the manner already pointed out,* and the head must be brought to the pelvic brim, in the situation most favourable for its exit; namely, with the face to one ilium, and the occiput to the other, in the transverse direction, which in the contracted pelvis is the longest diameter. We must then pass a finger of one hand into the mouth, and depress the chin, while we make traction by the two first fingers of the other, fitted like a crutch across the shoulders; taking care not to dislocate the neck or injure the jaw. By this means we shall probably enable the head to pass the brim; and when it has entered the pelvic cavity, we may turn the face into the hollow of the sacrum, and we shall generally have it in our power to complete the delivery with little difficulty, since the principal impediment will have been already overcome. (Plate 68.)

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* Page 348.

Wherever there exists a diminution of space at the superior aperture of the pelvis, however slight, it is even more necessary to be careful that the face is turned to the iliac fossa, while the head is passing the brim, than when the organ is of normal size; for reasons not necessary to be again insisted on.*

If, then, we have placed the head in this most favourable situation, and made use of as much exertion as we think ourselves warranted in doing, for the space of twenty or thirty minutes, without the expected success, we shall be compelled to diminish its bulk for the purpose of accomplishing extraction; and the operation is not much more difficult than if the head had originally presented.

The same instruments are required for lessening the bulk of the skull in this, as in cases of head presentation. The cranium must be perforated, and the brain partially evacuated, and we can feel no hesitation in thus acting, if the head will not pass entire, because the child must have lost its life before the operation can be required. No person would think of perforating the skull before some considerable efforts had been made to extract it whole; and under those efforts the chance—amounting, indeed, to a certainty—is, that the pressure on the funis will have been so great as to destroy the infant's life. On some occasions I have witnessed the gradual death of the fœtus from this cause, while I was unable to prevent it, or advance succour; and in others I have delayed applying the destructive means until the vital spark had flown; shrinking from being myself the instrument of death, but choosing rather—however sad the alternative—to wait quietly until I was assured the heart's last pulse had throbbed.

Mode of performing the operation.—The woman lying on he left side, an assistant must, by drawing down the body, bring th child's head as low as possible, and turn the neck upward under the symphysis pubis, so that one acromion is towards th *mons veneris*, and the other towards the *fourchette*. An unoc cupied space at the back part of the pelvis is thus procured, in which we can insinuate two or three fingers of the left hand wit ease; they must be carried up against the skull, to the projection behind that ear which is next the sacrum. Along the groove between the two first fingers a perforator must be passed; and, making steady pressure against the part, with a semi-rotatory motion; we must introduce its point within the skull as far as the rests; the two handles of the instrument must then be separated by an assistant, the rests being protected by our own fingers, in the way that I recommended before (Plate 57), and a crucial incision formed, if practicable. Having made an aperture sufficiently large to admit the perforator fully within the cranium, we must break down the brain as perfectly as possible, and commence extraction. We seldom require to use an extracting instrument, since the means of traction is afforded by the body of the fœtus itself; but if it should be requisite, we can fix the crotchet on the inner surface of the bone, and a very firm purchase is obtained, because of the strength of the cranium at its base. It may possibly slip, or break away from its hold, when another point of resistance must be sought for; and while making these efforts we must be most assiduous in guarding the extremity of the instrument by our finger, to prevent laceration of the os uteri or vagina. If possible, an extracting instrument should be avoided; but if any be required, the crotchet or blunt hook appears to me by far the most applicable.

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* See page 346.

There is certainly more difficulty in perforating the skull behind the ear, than when the vertex presents; and that for three reasons. In the *first* place, the vagina being partly occupied by the neck, our movements are rather impeded. *Secondly*, the bones at the base of the skull are thicker, and consequently we must use more exertion in perforating them. And *thirdly*, the point of the instrument is more liable to slip to one side, to run up between the bone and the scalp, and not to enter the skull at all. Such an occurrence is easily known by the very slight resistance offered to the passage of the instrument up to the rests; and also by carefully examining, by the finger, the laceration we have made. If we find no jagged edge of bone, it is merely the scalp that is punctured, and we must make another attempt, by turning the extremity of the instrument a little more in the direction of the centre of the cranial cavity.—Sometimes, indeed, the perforator will slip in the same manner between the skull and the scalp, when applied to the vertex under a head presentation, and may produce some embarrassment; but this mischance is not so likely to occur when the head presents, as in the case now under consideration, because we have then a better opportunity of directing the point against the spot most dependent, and because the bones at the upper part of the cranium, not being so resistant, yield more readily.

If plates 9 (fig. 2), 10 (fig. 1), and 11 (fig. 2), be consulted, they will immediately show that it would be impossible for the breech to pass through such pelves as are there depicted, even were it diminished to the utmost extent it is capable of,—by the legs having been first extracted,—and compressed into as small a space as the semi-ossified structures will allow. When such an aggravated state of disproportion is found to exist, one alternative alone is offered us,—that of performing the Cæsarean section; and it becomes of importance to determine the size of the pelvis under which we are warranted in having recourse to this terrible expedient. It appears to me that somewhat more room would be required for the transmission of the body and shoulders, under a breech, than under a head presentation; and, provided the conjugate diameter measured less than one inch and three quarters, I should think myself justified in proposing the abdominal incision. It certainly never occurred to myself to meet with a case in which the breech would not pass by the use of the means already recommended: such instances, however, are far from impossible. Even should we succeed, after much exertion, in extracting the body and shoulders of a child through a pelvis less than the dimensions I have just noticed, still I apprehend that the head, in this position, would require considerably more space, after perforation was effected, than when the vertex presented; and on this account also I should be inclined not to attempt delivery *per vias naturales,* unless there existed a clear space of one inch and three quarters,—at least, if either its own movements or stethoscopic examination assured us that the child was living.

PELVIC TUMOURS.—Other causes than distortion of the pelvic bones may occasion a want of the necessary space for the passage of the breech: thus tumours may have formed in the cavity, such as I have before described—exostosis, diseased ovaries, skirrhous and suppurating glands, polypi, and some others; and there are no specific rules which we can apply to breech presentations, under these deviations and difficulties, that are not applicable also to cases in which the head presents. Our indications are exactly the same; we save the child if we can, but not at the expense either of the mother's life, or of extensive, and perhaps eventually fatal injuries to her person.

If the tumour possess the least evidence of fluctuation, or indeed, if any impression can be made on it by the finger, presuming it to be a suppurating gland or enlarged ovary, it should be punctured. If there be a polypus in the pelvis, impeding the passage of the child's breech, trunk, or head, it should be removed, provided that can be done without much danger to the mother; but if the tumour be hard and immoveable, so that we cannot lessen its bulk, and fear to dissect it away from its attachments, we must act upon the common principles,—wait for some time, in the hope that nature may overcome the impediment, and if she fail, traction must be made by the finger or blunt hook surrounding the groin; or the Cæsarean section must be resorted to, according to the available space which the pelvis possesses.

Rigidity of the os uteri, vagina, and perineum, singly or combined, may occasion difficulty, as noticed under the head of lingering labour.

Under this complication, the os uteri may probably be relaxed by bleeding, by enemata, by the injection of warm oil or mucilaginous fluids into the vagina, and we may possibly deem it necessary to exhibit opium: the vagina and perineum may also be softened, perhaps, by artificial lubrication and external fomentations. Failing in these means, delivery must be resorted to by measures already sufficiently explained.

Head left in utero.—In the ages of rude surgery,* it was not a very uncommon occurrence for the head to be separated at the neck by violent and ill-directed efforts, and left in utero after the extraction of the rest of the body; but to meet with such a case now is rare. The only instance in which this accident came under my own treatment, happened in the practice of a midwife attached to a charity of which I had the charge. The child was putrid, and she had been attempting to extract it without reference to the propriety of its position. When I arrived, I found the chin hitched upon the sacral promontory, the vertebræ entirely separated, and the cranium attached to the body by a very small portion of integument, which gave way completely on the least handling. There was a tumour in the pelvis, that possessed the characteristics of an enlarged ovary. Not desirous of encountering these difficulties alone, I requested my father's assistance, who promptly attended. Having introduced his hand into the uterus, he changed the position of the head, so that the crown came to the pelvic brim, and perforated it at the sagittal suture, while I steadied the uterine tumour externally. We had then little trouble in extraction; and this method appears to me the most likely to succeed of any which has been practised; but under such anomalous cases no rule can be laid down for universal, and scarcely for general, guidance.†

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* See Ætius, tetrab. iv. sermo iv. cap. 22; also Paré, book 24, chap. 26.

† Meigs (p. 406), following the French school, advises that the forceps should be applied over the head, if any difficulty arises after the birth of the body; and Keating, who superintended the publication of the last American edition of this work (p. 340), gives the same advice. He recommends also that whenever the breech is detected, the forceps should be sent for, to be held in readiness. I never found such a mode of proceeding necessary, and have always rather trusted to traction by the trunk for the completion of the delivery.

TRANSVERSE PRESENTATIONS.

The second order of preternatural cases embraces all those in which any part of the fœtal body presents other than the head, breech, or inferior extremities. When the fœtus lies transversely, the long diameter formed by its doubled body being across the uterus from side to side, the familiar term *cross-birth* is peculiarly applicable; and to this variety of preternatural cases it should, in strict propriety, be limited.

I have already stated it as my opinion, that there is no part of the child's body which may not offer itself as a presentation under labour. It will therefore necessarily follow, that when situated transversely, the head may lie upon the right or left ilium, with the face directed either forwards or backwards, so that either the right or left side, the back, chest, or abdomen, may be placed downwards.

It is of the highest importance that we should be able to discriminate in practice between the first and second orders of preternatural presentations, because—as already shown—those which are embraced within the first are, generally speaking, terminated by the efforts of nature alone, or with very little artificial assistance; while, in those characterising the second order the very reverse obtains;—the child is so placed that Nature unaided can scarcely ever effect her object; and an operation always attended with pain, difficulty, and danger, is requisite before delivery can be accomplished. This operation, if undertaken during the first stage of labour, is comparatively easy; but, if delayed until the process is much advanced, it becomes one of the most difficult in surgery; and, *cæteris paribus*, the danger attendant upon it is in proportion to the difficulty. It would be superfluous, therefore, to insist on the necessity of early forming a correct diagnosis.*

There are no symptoms manifested, previously to the commencement of labour, by which we are able to determine that the child lies transversely in utero. It has been said that if the uterus, in its general figure, be broader than it is long, we may suspect a transverse presentation under labour: this, however, is by no means universally the case; it is but a vague supposition at the best, and no reliance can be placed on it: for the greater breadth of the uterus may depend on its containing twins; and although they both may be lying either with the head or breech downwards, it is evident that the organ must occupy more space laterally than if there were but one child lying in the natural position. An increased quantity of liquor amnii may also influence the shape of the gravid womb; and sometimes the uterine fibres are not developed with their accustomed regularity, but some, more rigid than the others, refuse to yield in due proportion, and thus occasion an unusual form. We can, therefore, by no means rely for a diagnostic mark on the external figure, as detected by the application of the hand.

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* As in breech presentations, so with regard to transverse cases, the proportion to natural births has been variously estimated. In the *Maternité* at Paris, out of 10,742 children born between the 1st of June, 1829, and the 1st of June, 1833, there were fifty-nine by "the trunk," about one in every 182 cases. (Dubois, Mém. de l'Académie Royale, tom. iii. p. 450, 1833.) Collins (Op. Cit. p. 73) gives us an average of one in nearly 416, the calculation being taken from 16,654 births. In the Royal Maternity Charity in this city, out of 68,435 deliveries, of which on this subject I have an accurate register, the proportion of transverse presentations is one in nearly every 311 cases, including twins and premature children. In the second edition of this work, the average, as taken from 55,172 deliveries, was stated to be one in about every 330¾ cases.

Nor are there any causes evident to which we can assign this peculiar presentation of the fœtus. I have already mentioned that particular postures of the mother's body were supposed to regulate in some degree the position of the child in utero; but this observation is proved to be as incorrect in regard to shoulder presentations as it is to breech.*

Transverse presentations are by no means comparatively more frequent among the poor than those in affluent circumstances: but some women seem to be naturally predisposed to this irregularity. Thus a patient, whom I attended in all her labours, out of five children which she has borne, has been the subject of four transverse presentations: her pelvis is slightly distorted at the brim. And another woman, now dead, who always, under pregnancy, became a patient of the Royal Maternity Charity, in twelve labours suffered seven shoulder presentations. I delivered her myself five times under these difficulties, and my father twice. This person also possessed a contracted pelvis.

Suspicious symptoms.—It is, then, only after labour has commenced, and when, indeed, it has made some progress, that we can positively detect a transverse presentation. We may *suspect* an irregular position, if the os uteri, although flaccid, opens slowly—if the membranes protrude into the vagina rather in the form of the finger of a glove than the round end of an egg—and if we cannot feel any part of the child, even when the finger is carried up to its full extent within the vagina; for it will be easily understood, that when the shoulder presents, the fœtus cannot descend into the pelvis in the same way as when the head or breech offers at the brim, its body being supported by, and resting on, the alæ of the ilia.

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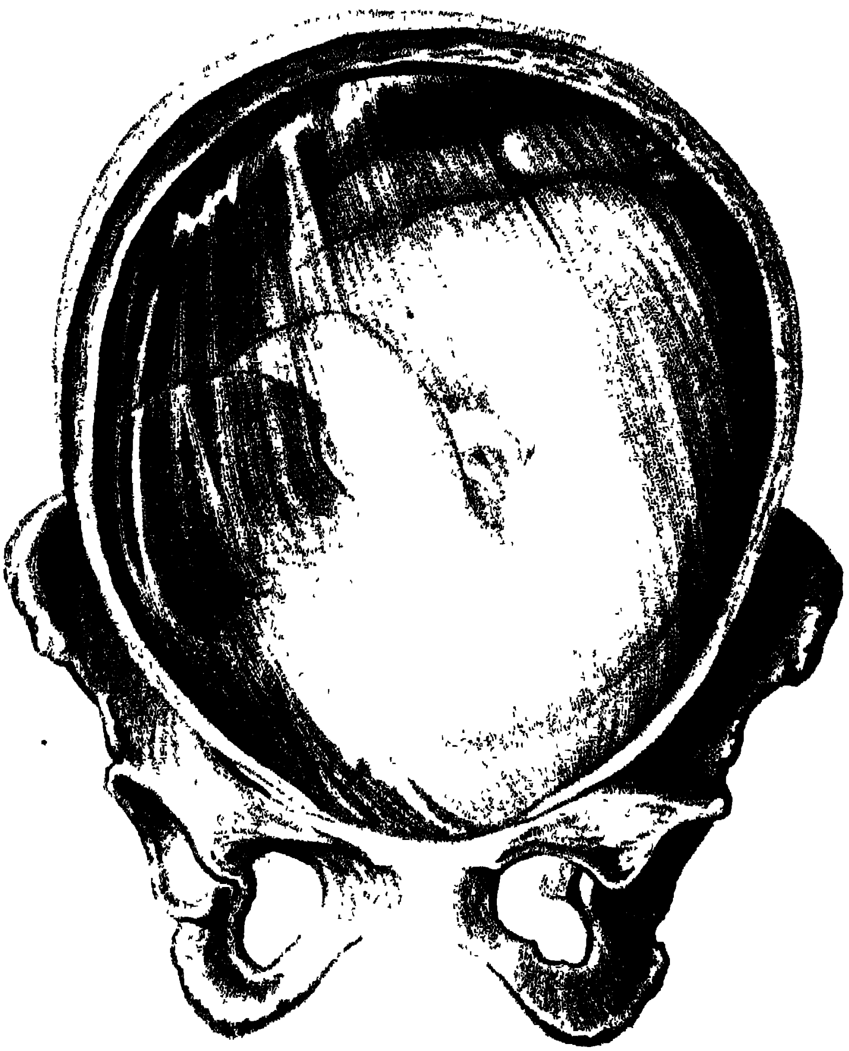
* Mr. Barlow's idea, that preternatural presentations are more frequent under distorted than well-formed pelves, has already been noticed, page 330; and Denman (ch. xiv. sec. 8) incidentally remarks, "Having been called to women at the beginning of labour, and finding by an examination that the head of the child presented, I have left them for several hours till the first changes were naturally made. When I have examined them on my return, I have found the arm of the child presenting, the head being departed out of my reach. I do not know that any practical advantage is to be obtained by a knowledge of these cases; but it is remarkable, that the accident has always happened to women who were deformed. Such cases, however, should be recorded, and it is possible that some time or other the knowledge of them may be of use. It may lead to an explanation of one cause at least of preternatural labours." One exactly similar instance has happened to myself; and other practitioners most probably also have met with such; but as yet no useful result has originated from Denman's observation.

We may also *suspect* that the child is lying transversely, if after the membranes have ruptured, the uterus ceases to act for some hours; for it often happens that, although the pains had been frequent and powerful before the membranes broke, they cease entirely for a considerable time, directly the first stage is completed. This is owing to the os uteri having lost the stimulus previously afforded it by the aqueous cyst, while that bag remained whole; for as the fœtal body is, as it were, suspended by the sides of the maternal pelvis, the presenting part cannot immediately subside to the mouth of the womb, as occurs when either the head or breech is protruded first. But we can only *positively detect* a transverse presentation, by distinguishing the different parts of the child, which indicate to us the mode in which it lies.

Progress of the labour.—Labour, then, would most likely begin less actively than under a head presentation; the uterus would become somewhat diminished in bulk before the dilating process commenced; but, for the reasons I have assigned, its neck would not so fully descend into the pelvis as when the head or breech presents. At first the pains would be short and infrequent; they would then become more powerful; the membranes would burst; and after their rupture, the uterus would probably remain an indefinite time inactive. On the resumption of its powers, however, the presenting part would be more or less forced down into the pelvis; and in time, provided the case were left entirely to the natural efforts,—no artificial assistance of any kind being rendered,—one of three things must happen: either the uterus, by its own inordinate action, must rupture its own structure—an accident which is almost invariably fatal; or by a continuance of its strong exertions, it must wear itself out, and gradually cease to act, which state will be accompanied by exhaustion, and death will sooner or later occur; or, thirdly, the child's body will be squeezed into a smaller compass—will be propelled through the brim into the cavity of the pelvis, and will eventually pass double: for I can scarcely believe it possible that the woman could survive the entire dissolution of the fœtal body by putrefaction, the separation of its limbs and other component parts, and their evacuation in a disjointed state. The doubled expulsion, or, as



patella, with its flat surface, which is more or less moveable on the condyles of the thigh-bone. On the contrary, in the elbow we detect the pointed olecranon sharper than the patella; we look in vain for the smooth, flat surface which the knee presents, and we can by no means move it from side to side. This last distinctive mark, however, of the presence of the knee, should not have much stress laid upon it, as in this respect we are likely to be deceived; for when the leg is turned back on the thigh, the patella is so fixed, in consequence of the extension of the rectus femoris, that its mobility is considerably impeded. Yet, if the other marks are borne in mind, we cannot well be mistaken. Should any doubt still exist, let us not lull ourselves into dangerous apathy, by calculating the many chances which there are in favour of its being a knee rather than an elbow presentation; but let us institute a more careful examination. If no part of the child's body except the presenting limb is to be felt—provided the membranes are broken—it would be right to bring the folded extremity fully down, *avoiding, however, all traction*,—so that we may be able to ascertain whether it be an arm or a leg; for even should the shoulder or side be occupying the brim, this proceeding would add no difficulty to, and not in the least embarrass us in, the subsequent operation of turning.

Hand.—It is not often that the hand presents alone, so that we are unable to feel any other part of the child's body: should that, however, be the case, it would be known from a foot (and that is the only part with which it can possibly be confounded) by negative as well as positive signs: by there being no rounded instep,—no prominent heel,—by the digits not all being in one line. The positive signs are the flattened palm, the fingers being longer than the toes, and themselves not all of the same length, and the thumb forming an antagonist power to the other four. But the being able to feel the hand does not necessarily imply that the child lies in a transverse position; for it is by no means unusual for this member to be placed upon the ear, or by the side of the breech, and to prolapse before either of those parts, as soon as the membranes break; which cases, as will be hereafter proved, require little artificial interference.* It becomes our duty, then, as soon as a hand is detected, to examine most minutely, for the purpose of ascertaining whether the head, breech, or shoulder, be at the brim; and to act according to the information we then obtain.

Side.—The side of the child may present, and here also we have some negative as well as positive marks to guide us. The side possesses neither the roundness nor the firmness of the head, nor any sutures nor fontanelles; neither is there the double

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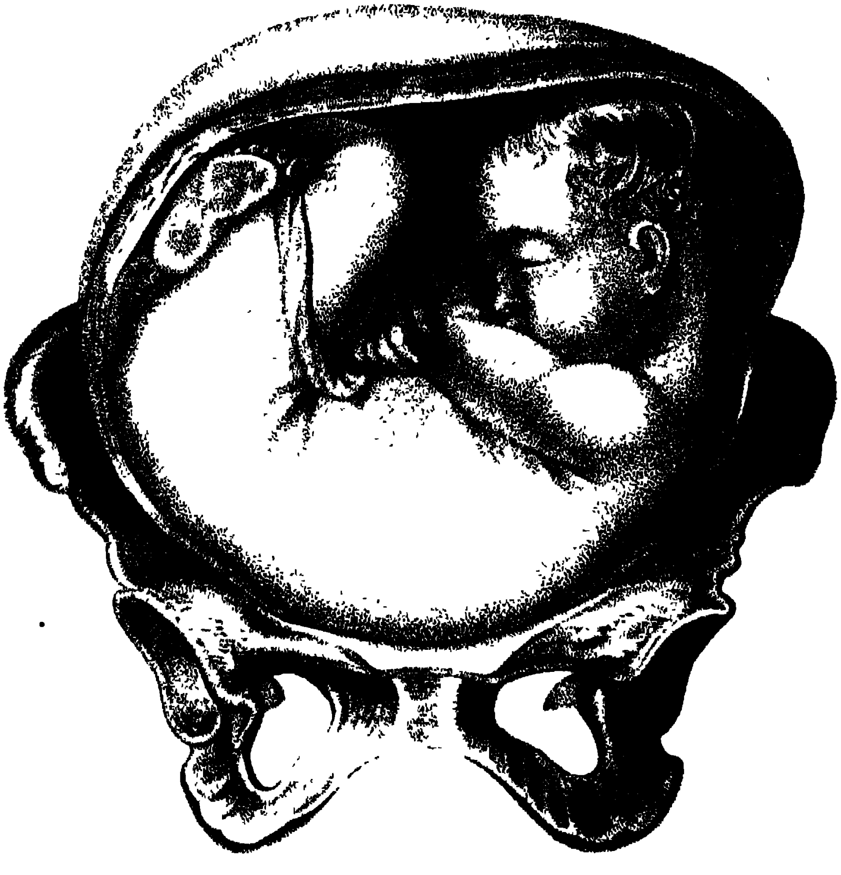
* See Plate 81.



rotundity nor the soft, fleshy feel of the breech: we cannot distinguish the parts of generation, nor the anus—we can feel no part of the child except the ribs, and, it may be, the arm also. The side may be principally distinguished by the spaces between the ribs; and if two of these can be clearly traced, there can exist no doubt as to the presentation. The head is the only part of the body for which the side is likely to be mistaken; and I have actually known this mistake occur. If we could only feel two ribs and one intercostal space, it might be possible for us to be deceived; we might suppose the margin of the ribs to be the edges of the parietal bones, and the space itself the sagittal suture. But if there be any doubt in regard to the presentation, it is better to introduce two fingers of the left hand fully up to the pelvic brim, rather than allow hour after hour to elapse in doubt on so material a question.

Back.—A child may present with its back (Plate 71), although this is a very uncommon position for it to lie in. Three or four of the spines of the vertebræ can be felt by the fingers; and we can also detect the origins of the ribs, even before the os uteri is completely dilated. When the back presents, it is of no consequence whether the part directly over the os uteri be near the shoulder or the breech,—whether we feel the lumbar or the dorsal vertebræ; the same thing is required to be done—the hand must be introduced into the uterus, and the breech or the legs must be brought down.*

Sternum.—The chest may present,—any point of the sternum meeting the finger. There would be difficulty in detecting this presentation by the first finger of the right hand; but by introducing two fingers, or more, of the left hand, we shall feel the sternal bones, the continuance of the bony plane, the ribs,—or rather the cartilages, at their origin from the sternum,—and the intercostal spaces. This is a rarer presentation than any of those previously treated of.

Abdomen.—The rarest presentation, perhaps, of all is the abdominal (Plate 72). Out of nearly two hundred transverse presentations in which I have operated, I have only met with this peculiar position once.† There can scarcely be a chance of our mistaking this presentation. Even before the membranes break, we may be able to feel the large soft abdomen, possessing no osseous formation, occupying the whole or chief part of the pelvic brim; and, after the escape of the liquor amnii, it will be squeezed more or less through the brim into the cavity; we shall perhaps be able to distinguish the ensiform cartilage; but a more positive mark will be the insertion of the funis umbilicalis. Whenever we can feel the commencement of the cord by the finger, there exists a belly presentation most undoubtedly. It must not, however, be supposed that all cases in which a fold of the funis comes down into the vagina must turn out presentations of the abdomen, because the cord frequently prolapses when other parts of the child are at the brim. (Plates 64, 73, 81.)

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* Giffard details three back presentations, Cases 77, 142, and 192.

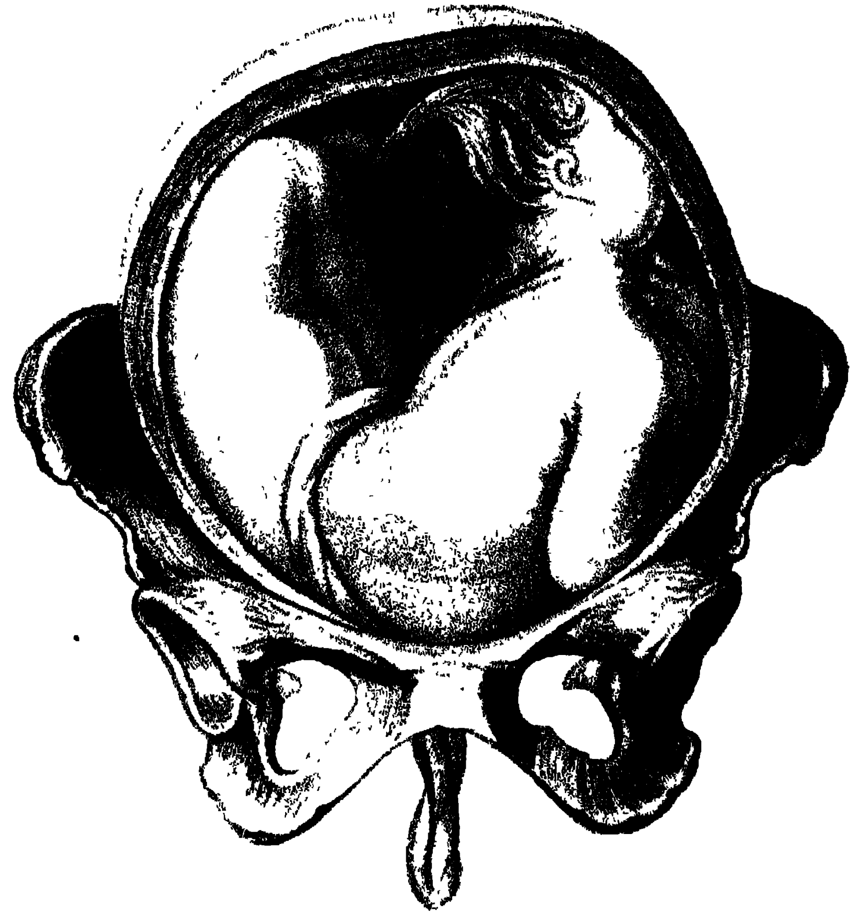
† Besides the case mentioned in the text, in December, 1850, a presentation of the abdomen, at full time, occurred in a patient of the Royal Maternity Charity. The woman was delivered by one of the district surgeons.

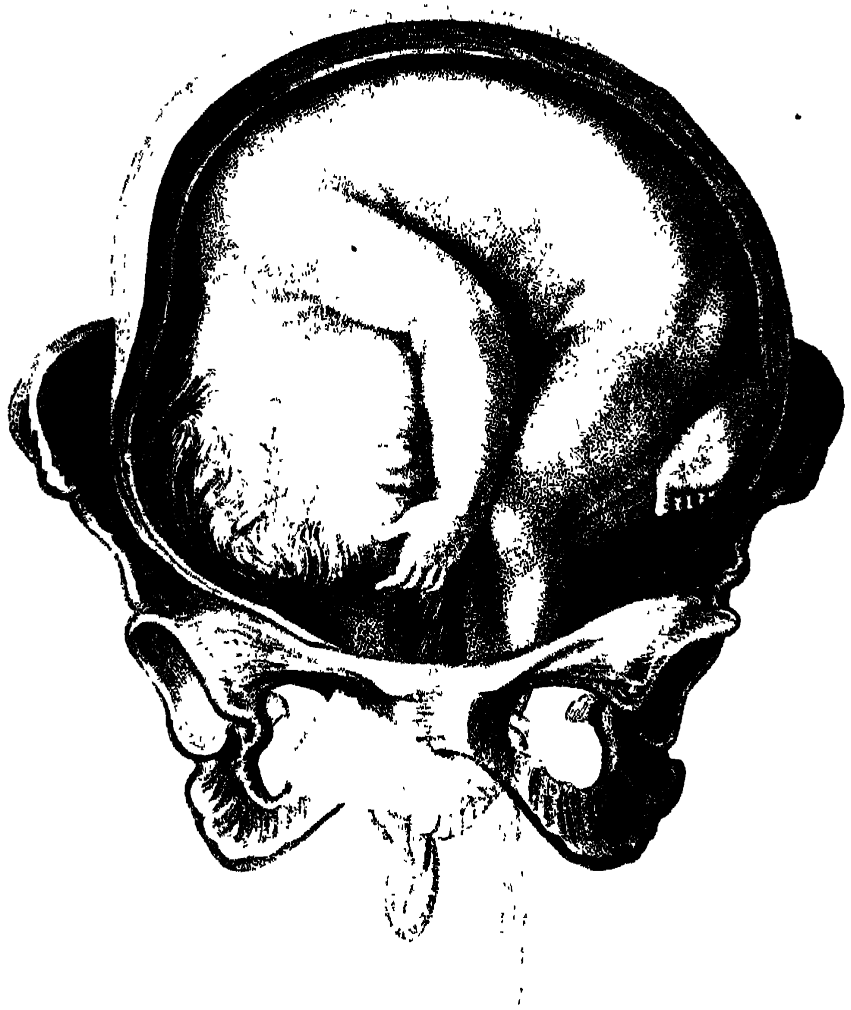
We sometimes meet with more complicated presentations, such as both the hands and feet together, or one of each different limb. Plate 73 delineates a case in which the hands, a foot, and the funis offered themselves at the os uteri. A piece of tape has been fixed round the left ankle, as a mode of traction. In such a case the evident means of relief would be to draw down the foot, and cause the breech to occupy the pelvic cavity. In performing this operation, however, the breech *must be brought by the operator well down into the pelvis;* else the head will not recede, and the uterus acting upon the curved back, will thrust the head and breech both together upon the pelvic brim, greatly complicating and increasing the difficulty of the case. This cause of embarrassment, indeed, I have known more than once happen, the attendant having been satisfied with bringing down the leg, without causing the fœtal body to make the necessary evolution. The feet, a hand, and the breech, are not very infrequently detected together at the pelvic brim; and I have known some few instances, in which the head, a foot, and a hand, were all presenting at the same time. If it were practicable under such a complication, it would be most advisable to push the hand and foot above the brim —as will be hereafter more particularly advised—and allow the head to come down alone; if not, to turn the child by traction at the foot, and bring down the breech.

Modes in which the operation of turning may be performed.— Having determined that the case under a transverse presentation is not to be left to nature—that it is more likely that the uterus will rupture, or that the patient will die exhausted, than that the child will pass double—we must make up our minds to change its position by operation. First, then, we will inquire in what that operation consists; and, secondly, what period of the labour we shall select for its performance.

Three different modes have been recommended, and they all, perhaps, enjoy their peculiar advantages.

The first is, that we should raise the presenting part, introduce the hand into the uterus, seize hold of the head, bring it to the brim of the pelvis, and convert the case into a natural presentation. The second advice is, that we should introduce the hand into the uterus, run it along the abdomen of the child, take hold





of the breech firmly, grasp it with the fingers, bring it to the pelvic brim, and make it a breech case. And, lastly, it is recommended to introduce the hand as high as the fundus uteri, running it along the body of the child, search for the feet, and, bringing down one or both, make the child perform a complete evolution, and extract it footling.*

Of these three modes, that of raising the shoulder and bringing down the head would be the safest to the child, because there would then be little chance of pressure on the funis umbilicalis; and it is that pressure which usually destroys the fœtus, when extracted by the breech or feet;—but, although safest for the child, it is the most dangerous to the mother, as well as the most difficult to the operator; and the danger, as might be expected, is in proportion to the difficulty. The form, size, and slippery nature of the cranium, all combine to produce this difficulty. Even although the shoulder might be raised from the brim, and pushed entirely out of the way, it is no easy matter to grasp the head, so as to bring the vertex over the centre of the superior aperture; and in these attempts, which will most likely require to be repeated, both the uterus and vagina would be seriously endangered. From the danger and difficulty accompanying this operation, it is now, I believe, entirely abandoned in England as a means of delivery under transverse presentations, although recommended by Dubois, as applicable to some few cases. Thus, of the fifty-nine cases of presentation of the trunk just adverted to, that happened in the *Maternité* at Paris, he states that two were terminated by bringing the head to the pelvic brim.

Delivery by the breech offers an expedient of safety to the child, second in degree: for, as already mentioned, when the legs and feet lie up against the child's body, the funis umbilicalis is, to a certain extent, protected from pressure, and the passages having been considerably distended by the transit of the breech, are rendered in a fitter state for the easy escape of the shoulders and the head, than when the feet are first brought down. But this mode of acting is also both difficult and somewhat dangerous, and that from the same causes which embarrass the operator in the attempt to bring down the head. We are not able to encompass the breech readily;—we cannot easily grasp it, so as to direct it over the pelvic brim, in consequence of its bulk and form.*

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* The ancients were fully impressed with the danger of transverse presentations; and in the works of Ætius, who was a compiler from previous authors, hints may be found relative to bringing down the feet by turning, under such an unfortunate situation. (Tetrab. iv. sermo iv. cap. 22.) The operation, however, was not generally adopted till the time of Paré, to whom, although he be not the first suggester of this great practical improvement, is justly due the honour of having satisfactorily proved its safety and utility, and enforced its adoption, both by his precepts and example. (Book 24, chap. 26.) Before Paré's time,—the middle of the sixteenth century,—there seems to have been instituted no precise rules for the management of this order of preternatural cases; it was the almost invariable custom to endeavour to bring the head over the pelvic brim, but, failing in that attempt, most writers directed that the child should be extracted in whatever manner was most practicable. In Celsus, indeed, we find it recommended, that *if the fœtus, when transverse, cannot be brought into a proper direction*—that is, with the head or feet over the pelvic brim—a hook should be fixed in the axilla, and traction gradually made by it; and that the neck thus doubled should be divided. (Lib. vii. cap. 29.) This advice, indeed, is given as applicable only to a dead child.

The third means is by far the most dangerous to the child, but by far, also, the safest to the mother—that of grasping one or both feet, bringing the breech, through the hold they afford, into the pelvis, and extracting the fœtus by their agency. This is the mode of delivery now almost universally adopted both in this country and on the Continent, and which I would strongly recommend in preference to either of the others, in all cases where there is a necessity for turning the child.

Period when the operation should be performed.—The time most favourable for changing the position of the child is when the os uteri, vagina, and external parts, are perfectly relaxed, while the membranous cyst remains still entire. The operation, then, should be delayed as long as is consistent with the integrity of the membranes, and the preservation of the liquor amnii within the uterine cavity, for the presence of the water allows the easy introduction of the hand completely within the womb, and permits the child, floating in the fluid, to be turned, by means of the feet, in any direction which is desirable. If, then, we have the conduct of the case from the commencement, we should operate before the membranes break.

But again, we cannot—and it would be idle to suppose that we could—pass our hand into the uterus before relaxation of the vagina and dilatation of the os uteri have proceeded to some extent. We could not expect to be able to effect our object, if the os uteri were not opened beyond the size of a sixpence or a shilling, unless, indeed, it were much softer than it usually is under this slight degree of dilatation; but when it has acquired the diameter of half a crown, or a crown, it will generally suffer itself to be dilated to such an extent as will admit the hand, without injury to its structure.

Since, then, it may be laid down as a maxim that it is highly desirable, under a transverse presentation, to change the position of the child previously to the rupture of the membranes, but that it is almost impossible to accomplish this object before the os uteri has acquired a certain diameter—since, also, there is great danger of the membranes breaking as soon as the bag occupies the vagina, so as to press at all upon the external parts—it becomes of importance that we should lay down some rule for our guidance in these cases, not perhaps universally to be followed, but to be classed among our general precepts; and the following seems the most applicable.

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* Ashwell (Practical Treatise on Parturition, p. 354) says that Dr. Hunter recommended his pupils to bring down the breech in preference to the feet.

As soon as the mouth of the womb is sufficiently open to admit the thumb and the four fingers as far as their second joint, we may expect that it will offer but a slight impediment to the passage of the hand, and it would be unwise to delay the delivery until the further dilatation of the organ; because, while we are procrastinating, the very accident may happen which it should be our object to prevent;—the membranes may give way, the liquor amnii may flow out, and the uterine parietes may strongly contract around the fœtal body. (Plate 75.) It is possible, however, that before the os uteri has attained the diameter I have just specified, while we are anxiously watching the progress of the case, the membranes may unexpectedly break. Under this unfortunate occurrence, even though we should have some difficulty in dilating the os uteri, we must proceed to the delivery, if it can be effected without injury. It is better that we should act thus than wait patiently for a greater dilatation, during which supineness on our part, the lapse of every minute is adding to the danger and distress incidental to the case, by increasing the degree of permanent contraction which the uterus is gradually taking on itself.

The principal difficulty in operating previously to the rupture of the membranes will usually be found to consist in the dilatation of the os uteri, the external parts, and the vagina: the difficulty afterwards is not so much in passing the hand up to the mouth of the womb, as in introducing it fully into the cavity; and the difficulty of dilating the orifice, unless preternaturally rigid, is trifling in comparison with that of overcoming the strength of the uterine contractions.

I have remarked that the uterine aperture has been more difficult of dilatation when the labour was premature; and I attribute the resistance offered to the introduction of the hand, under such a case, to the imperfectly developed state of the cervix, rather than to any spasmodic action in the fibres of the os uteri itself.

Mode of turning by the feet.—In the conduct of a case of this kind, then, it is very possible that in our first examination we may not detect positively the nature of the presentation, because the child lies too high for us to reach it easily; but if we find it difficult to touch the fœtal body; while at the same time the membranes are coming down in the form of the finger of a glove, these two suspicious circumstances may awaken in our mind a well-grounded fear that we have to deal with a transverse presentation. So long as we are in doubt, we must watch the case attentively, and by no means leave the house, even though the os uteri should not have acquired the diameter of a shilling. But when, in process of time, we have become certain that the child lies transversely, we need not exhibit any indication of anxiety or alarm; we must evade the patient's solicitous inquiries as to the *fairness of the case* by some general reply, and hold ourselves in readiness to act with promptitude, should the bag of waters break, or any other untoward occurrence take place. At the same time, however, that we keep her in ignorance of the unfortunate position of the child, it is right that we should apprise her friends that it is "a cross-birth;" that there are no dangerous symptoms at present; that she will require to be delivered by art before the labour can be terminated; and that the delivery, as it must be an artificial one, will necessarily be attended with hazard. After this explanation, if a consultation be required, it is much better to acquiesce than take the risk of the event entirely on ourselves.

Having conscientiously discharged this part of our duty, it is not desirable that we should be in constant attendance by the bedside of the patient, nor make frequent examinations, lest we should rupture the membranes. We have gained all the information we want: we cannot at present afford any assistance, and we may do irreparable mischief. We should pass our finger, however, occasionally, in the absence of pain, to satisfy ourselves as to the degree of dilatation that has taken place; and when the os uteri will readily admit the extremities of the thumb and the four fingers as far as the second joint, we are warranted in commencing the operation. For the first time, we must now tell the patient that the child is not presenting in the most favourable manner, but that we are about to remedy its unfortunate position; and we may assure her, should she press the subject, that what we shall do will not place her in danger; and that she will not experience more pain in the aggregate than if the presentation were natural, although it may be a little more acute for a short time.

In proceeding to the operation, the first thing to be attended to is the position of the patient, and the second that she should be confined to a certain posture, so that she may not be able to move out of our reach. Unless we put her in a favourable position, we might as well expect to extract a stone from the bladder with the knees close together, as hope to effect a safe delivery. Dewees* and Meigs,† following Baudelocque,‡ and other continental practitioners, recommend that she should lie upon her back, with the nates made to project somewhat over the edge of the bed, and that the feet should be supported by two chairs at a convenient distance; the legs being separated, and the knees bent. I cannot but think that this posture would be very irksome and distressing to the woman, as well as inconvenient to the operator; and I much prefer the position adopted universally in this country,—which is, indeed, that commonly taken under labour,—on the left side, with the knees drawn up towards the abdomen, and the feet resting against the bed-post. The only alteration required is, that she should be placed directly across the bed, with her hips brought near its edge, that we may have her perfectly under our command. The next point is to restrain her in this position; and this we may accomplish without her knowing that we are confining her at all. We should request a friend to take hold of her hands; so as to steady the shoulders. Women know that in common labour, when the expulsive pains come on, they are much assisted by fixing the upper part of their person, through the means of a towel fastened to some unyielding point; and they therefore seldom object to grasping the hand of a friend instead. We must not fail, however, to give this assistant a previous intimation to resist any efforts which she may make to draw herself away. The nurse must then raise the right knee, and separate the legs; by which also the pelvis is steadied in one situation;—and unless the patient makes a violent effort, she is not likely to move far away. The operator must take off his coat, for without this precaution he will certainly be foiled: if he simply bends back the cuff, the hand is only admitted half within the uterus, and no advantage can be gained; should, indeed, the sleeve even allow of being turned up above the elbow, it compresses the biceps, cramps the other muscles, and prevents the free motion of the arm. The left arm* and hand must be bared, and anointed with some unctuous application; care being taken not to grease the inside of the fingers, or the palm. Kneeling then by the bed-side, rather than sitting, he must bring the tips of the fingers and thumb close together, nearly into the same level; and thus, forming the hand into the shape of a cone, commence the process of dilating, —with the utmost delicacy and caution,—first the external parts, next the vagina, and lastly the os uteri itself. While thus introducing the hand, it is better not to pause until it be fairly passed within the uterine mouth,—unless, indeed, more than ordinary opposition be experienced,—and he must by no means withdraw it, lest he lose the advantage he has already gained; he must therefore be prepared to withstand the entreaties of his patient that he should desist from the attempts he is making.

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* System of Midwifery, parag. 682.

† Treatise on Obstetrics, p. 367.

‡ Parag. 1135, translation.

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* The recommendation that we should use, for this operation, the *left* hand, in preference to the *right*, is grounded on what I consider four very valid reasons, presuming that the patient is placed on her left side across the bed. *First*, when the tips of the fingers are brought nearly together, so that the hand resembles a cone, and forms somewhat of a wedge, the left hand enters the vagina, more easily than the right, passing upwards in the direction of the axis of the external parts. *Secondly*, when it is lodged in the vagina, fully occupying the pelvis, the knuckles of the left hand adapt themselves completely to the cavity of the sacrum, and the hand itself is carried up to the brim, in the direction of the axis of the brim, following the curve of the canal. *Thirdly*, when it is passing the brim, while dilating the mouth of the uterus, and entering its cavity, it takes the direction of the axis of the uterus, which lies with its fundus forwards, and its mouth looking back towards the sacrum. *Fourthly*, when the left hand is in the uterus, an opportunity is given us of steadying the uterine tumour externally by the right, carried between the woman's thighs, and placed on the abdomen. The consent between the two hands affords an infinitely greater facility in action than could be attained by the aid of any assistant. An act of volition is all that is required in order to a co-operation of these two members;—the mind begets the thought, and at the same moment the limb performs the deed willed. But if we have to give directions to a party standing by, time is lost, the progress of our proceedings is interrupted, and the probability is that our orders will be obeyed in an imperfect and faulty manner. If the *right* hand be attempted to be passed into the uterus while the woman lies on her left side, it will be immediately seen that the knuckles are opposed to the under surface of the symphysis pubis, that the tips of the fingers will rub along the cavity of the sacrum, and that the wrist

The stimulus of the hand will most probably occasion an accession of uterine contraction, and the membranes will be protruded downwards against the extremities of the fingers, and burst without any effort on the part of the attendant. A small quantity of liquor amnii will escape externally; but as the pelvis is more or less occupied by the hand and arm, a plug is formed, which prevents the entire evacuation of the water; so that this fluid, being retained within the uterus, permits the child to perform a perfect and easy evolution. The membranes being broken, the hand enters into the centre of the cavity of the ovum, and comes into immediate contact with the fœtal body.

It is not *absolutely necessary*, before proceeding to the operation, minutely to ascertain the position in which the fœtus lies —although to have obtained such knowledge might be *desirable;* for, the fingers being carried round to the chest, the hand may be slid along the abdomen until one or both feet be felt; they must immediately be firmly grasped, and the breech carefully and slowly brought down into the pelvis. I think it highly desirable that both feet should be taken hold of, if they lie together, and can be commanded by the same effort, because the evolution is so much more easily accomplished when both are brought down; but if one only be obtained, it is neither necessary nor proper that we should spend time, and aggravate our patient's sufferings, by

must be bent far backwards, before the hand can enter the uterine cavity. To effect this object, indeed, we must place ourselves completely behind the patient, which is an awkward posture for ourselves, and not always to be accomplished. It may be answered, that as the right hand is used by most persons in the ordinary occupations of life, in preference to the left, they, therefore, have recourse to it in all acts requiring any nicety of manipulation. But the degree of command which we possess over the one, greater than over the other hand, is almost entirely the effect of habit; and every young surgeon should accustom himself to use each in many offices connected with his profession,—such as bleeding, for example,—indiscriminately. If he follows this advice, he will soon find himself as apt with his left hand as his right.

searching for the other.* The breech being in the pelvis, the principal difficulty of the case is over; it is reduced to one of the first order of preternatural presentations, and must be terminated by the rules before laid down. Some have recommended that, after the feet are extracted, we should leave the case to be concluded by uterine action; but the highest authorities all agree that it is better to terminate it by a continuance of artificial efforts—gently, tenderly, and cautiously applied—taking advantage of the assistance of the pains, and avoiding all hurry or violence.

In all instances where it becomes necessary to form this artificial change in the situation of the fœtus, a piece of strong tape should be procured, at one end of which a running noose must be made, to be applied, if requisite, over the fœtal ankle (Plate 73); for this will assist us materially in bringing down the breech, provided any difficulty be experienced in causing the child's body to revolve. This is, indeed, particularly useful, and almost indispensable, when the operation is performed under a strongly contracted uterus; and its mode of adaptation will be discussed when such cases come under review.

Again, before proceeding to the operation, it is right that we should satisfy ourselves that the bladder is empty; and if distended, it should be evacuated, either by the voluntary efforts of the patient, or by the catheter. We are recommended by some practitioners,† indeed, to throw an enema into the rectum in all cases, as well as draw off the urine. If the bowels be loaded, such a precaution may be highly proper, for the purpose of insuring as much room in the pelvis as possible, but ordinarily it will not be required; and if not necessary, may be hurtful, partly by complicating our duty, partly by the loss of time which must attend its administration, but principally from the stimulus which may be propagated to the uterus, and which may excite increased action in that organ—a circumstance we should be solicitous to avoid, at least before the introduction of the hand.

Nor is it of small importance that we should be perfectly certain, before proceeding to extract, that the limb we have grasped is a foot; for if we allow ourselves to be thrown off our guard by agitation, or, anxious to finish the delivery, are seduced into reprehensible haste, and, by mistake, bring a hand down into the vagina, the shoulder will come to occupy the brim; the fœtus will still be transverse, and we shall have to renew our attempts at "turning," under very much increased difficulties. The two limbs may be discriminated from each other by the marks before enumerated.*

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* Radford counsels us "never to bring down more than *one foot* in the manual operation of turning" (Essay 4th, on Difficult Parturition, p. 15); because the other thigh, being flexed upon the abdomen, offers a larger circumference than if it were extracted, and thus prepares the passages for the more easy transit of the shoulders and head. The advantage of this practice consists in its affording greater safety to the child: the disadvantage, in its creating more difficulty in accomplishing the evolution.

† Barlow (Op. Cit. p. 210) says, "On all occasions when the introduction of the hand into the uterus is required, it is necessary that the contents of the bladder and rectum be previously emptied."

After the arguments already used, it is unnecessary for me to impress the caution, that force in the introduction of the hand, being never called for, is to be deprecated in the liveliest terms; that hurry in the extraction of the child is not desirable, and seldom necessary; and that nothing can warrant us in having recourse to violence. And I trust I may be excused for insisting on the necessity of the hand being directed by the mind, even in the most trifling of our proceedings; and for conjuring the young practitioner ever to bear in remembrance—during this as well as all other obstetrical operations—the delicacy of the structures within which he is acting.

Turning when the uterus is contracted round the body of the child.—The operation of turning when the uterus is strongly contracted, is sometimes one of considerable difficulty; and under such circumstances the infant is seldom saved. It will rarely occur to the well-educated practitioner to meet with an aggravated case of this nature, when he has had the conduct of it from the commencement; because he will most likely have detected the position of the fœtus before the membranes break, and will have seized the first favourable opportunity for rectifying its unfortunate situation. But being called when the waters have been some time discharged, it will become a question for careful deliberation, whether we shall leave the case, in the hope and expectation that the child will pass double; or whether we shall attempt to assist Nature under difficulties which we fear she will be unable to surmount. As it would be unsafe to trust the delivery to Nature, we must accomplish it artificially; and we may either proceed to its completion immediately, or prepare the patient previously, by attempting to lessen the powerful action of the uterus. On this question the opinion of practical men is divided—some advising us not to delay a minute, others declaring that we should run the risk of injuring the uterus if we attempted to pass the hand during its contracted state; and that therefore we ought to stay our endeavours until we have obtained that truce which is so much to be desired, and, indeed, so necessary: and the instructions of each party are perhaps applicable to certain peculiar cases, and therefore, within certain limitations, to be followed. I am myself an advocate for the operation being performed as early as is compatible with the woman's safety; and I have almost invariably found that, if due caution be observed, it can be accomplished without the necessity of placing her under that severe and rigid system of treatment deemed requisite by some.

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* Page 36

The advocates for the practice of delay in those cases where the fœtal body is strongly compressed by the powerfully contracted uterus, instruct us to abstract twenty or thirty ounces of blood, so as to occasion syncope; and to avail ourselves of the state of relaxation which it is presumed will follow, for the fulfilment of our intention. If, notwithstanding the supervention of faintness, we cannot succeed in introducing the hand, to employ that agent which is supposed to rank second in effect in relaxing uterine contractions, softening rigid fibre, and overcoming clonic spasm —opium: we are taught to exhibit eighty or one hundred drops of laudanum immediately; and, waiting a little for the operation of the drug, to make another attempt. If, after the lapse of some time, we are still unable to insert the hand, we are recommended to exhibit twenty or thirty drops more at intervals, till we find that relaxation has taken place. The use of poppy fomentations to the vulva is advised; and it is also suggested that, where practicable, we might try the relaxing power of the warm bath. The tobacco enema is spoken of as being one of the most likely means to produce relaxation; although dreaded as a highly dangerous remedy. Failing, however, to effect our object by these various means, it is then recommended that we should wait till the uterus is worn out by its own powerful contractions, and that we should take advantage of the quietude induced by exhaustion.*

Notwithstanding the high names by which these measures come recommended to our notice, from most of them I entirely dissent, and, therefore, think it my duty to deprecate their use; because it is not so much the immediate delivery of the patient that we have in view, as her ultimate safety. If, then, by such means as bleeding, opium, tobacco, or any other depressing or narcotic agent, we bring the system into such a torpid state as completely to remove uterine contraction, we deprive the woman of that very power which is to place her in safety after her delivery; and we prevent the closure of the uterine vessels, a patulous state of which must lead to fearful hæmorrhage. I cannot help thinking that, if we deliver the patient either while under syncope from bleeding, or stupefaction from opium or tobacco, we should be emptying the uterus at a time when it could not exert its contractile energies; we should consequently leave it in a flaccid state, and bring the patient into the greatest peril. Besides, I very much doubt the power of these means to insure the end proposed; for it is not only the occasional action of the uterus which prevents the introduction of the hand, but the permanent contraction of its fibres, which is induced by, and consequent upon, that occasional action. When the difficulty merely arises from the violence of the labour pains, we may gradually insinuate the hand during the interval of action; but when a *permanent* decrease in the capacity of the uterine cavity has taken place, through a continuance of that occasional or intermitting action constituting the throes of parturition, a state of tonic contraction is induced, which is constant and unyielding, and which it would be fruitless to endeavour to remove either by bleeding, opiates, or any other antispasmodic powers. Of all the expedients spoken of, bleeding and fomentations are the only ones which I would be inclined to employ; and these, not with the view of taking off uterine contraction, but of subduing inflammation of the structures, consequent on pressure.

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* See Blundell's Obstetricy, by Castle, p. 402.

Should, then, this reasoning be correct, and should the means so confidently recommended prove of little or no avail, they must be injurious in the same proportion as they depress the system, and it would be unwise to rely upon, or indeed to adopt them; especially as other modes of delivery are placed within our reach, —when judiciously directed efforts at turning fail,—without subjecting the patient to such additional causes of danger.*

Feeling so strongly on this subject, I think it my duty to recommend that, in all cases where the membranes have been broken for some time, delivery should at once be proceeded with, provided the vagina and vulva be relaxed, and not swollen from inflammation, and provided the os uteri also be fully open; and if the endeavours of the attendant, judiciously directly and steadily persevered in, be frustrated, that he should pause, and consider carefully and attentively every circumstance connected with the case, that he may inform himself of the particular cause of the extraordinary difficulty he experiences. I would only again urgently caution every young practitioner against using undue exertion—against endeavouring to overcome the resistance by force or sudden jerks, rather than by a continuance of gentle means—and against *forming a resolution to deliver* by turning, at all hazards; and I am persuaded, if the recommendations hereafter to be submitted be followed, he will be able to effect the requisite change in the position of the fœtus, and avert the necessity of having recourse to the severe measures adverted to—provided, indeed, the version can be accomplished at all.

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* The observations I have ventured to make in the text are not founded on speculative reasoning, but are the result of somewhat extended practice. Between the years 1823 and 1852, I delivered nearly two hundred women under transverse presentations, independently of a few cases to which I was summoned where spontaneous evolution occurred. Many of these cases presented a formidable appearance; for in one, the membranes had been ruptured a whole week; in another, sixty-nine hours; in a third, fifty-eight hours; in another, fifty-five; in another, fifty-three; and in many, more than forty-eight: and, as a general principle, we presume that the longer the liquor amnii has been evacuated, the more likely is the uterus to have embraced the fœtal body firmly, and the more difficulty will there be in overcoming the resistance we meet with. In none of these cases did I exhibit large doses of opium, and in those few where bleeding was practised, that operation was had recourse to, not for the purpose of relaxing the rigidity of the uterine fibres, but to relieve the inflammation which the soft structures were suffering, and to remove tumefaction. In not one of these instances was any injury inflicted on the uterine structure by the hand, as far as I know; nor did any permanent evil arise that could be attributed to the operation. In fourteen cases the uterus was so powerfully contracted as to refuse admittance to the hand, and compel me either to exviscerate or decapitate the fœtus, all of which were of course previously dead.

Mode of performing the operation.—Although, when speaking of turning the child while the uterus was still distended with the waters of the ovum, I stated it as my opinion that it was not absolutely necessary to acquaint ourselves positively with the peculiar position of the fœtus—both because, when the hand is introduced into the uterine cavity, it can be carried easily along the body of the child until one or both feet be felt, and because of the difficulty of detecting the exact mode in which it lies previously to the rupture of the membranes—the case is very different when the uterus is strongly contracted; it then behoves us to ascertain most distinctly its situation before we attempt to remedy it: and this information it is not difficult to gain, by observing which hand protrudes, and attending to the direction of the palm. We know the right hand by the thumb being opposed to our own when we place the palms together; and we know that the palm of the child's hand must be looking in the same direction as the abdomen, unless the arm be twisted. Thus, then, if the right hand be external, with the palm directed anteriorly, the head must be lying on the right ilium, and the face must be looking forwards: if the right hand be down, with the palm towards the anus, the head must be placed on the left ilium, and the face turned towards the spine: if the left hand be protruded, with the palm forwards, the head must be on the left ilium, and the face looking to the abdominal muscles; and if the left palm be directed backwards, the head must be on the right ilium with the face towards the spine. Having learned, then, on which side the head lies, we know that on the opposite we shall find the breech; and having ascertained whether the face is situated anteriorly or posteriorly, we know also that towards the same part of the uterus we shall encounter the legs; and thus, so far as guiding our hand immediately to the child's feet is concerned, the operation is much simplified.

But it is possible that neither of the fœtal hands may be protruded externally, although the membranes may have been ruptured for some hours, and the shoulder may be fully occupying the pelvic brim;—the elbow may be situated in the vagina doubled. Under this state it may be difficult to distinguish the right from the left extremity, by making our observations on the arm itself alone; and it is much better quietly and tenderly to unbend the limb, so as to bring the hand down, than to commence the operation in ignorance of such an important point.

It may perhaps be asked, Why should we bring down the arm, and impede the subsequent steps of the operation by filling up the pelvis with the limb?—I would answer, that it is not the arm which prevents us making the evolution; it is the shoulder and the body of the child blocking up the pelvic brim, forced down by the strength of the uterine contractions: it is, indeed, of little consequence whether the hand is external, or whether the arm is doubled, the elbow presenting in the vagina. And if we have any doubt as to whether the presenting limb be the right or the left arm, it appears to me the best practice with care to bring it fully down.

Some practitioners advise that, if the palm be looking towards the mons veneris—inasmuch as the feet must then be placed anteriorly in the uterus—the right hand will be more conveniently used than the left; because that hand, traversing the fore part of the uterine cavity, passes up at once to the very spot where the feet lie.* If the right hand, indeed, adapted itself as well to the axis of the external parts, to the curve of the sacrum, and to the axis of the uterus, as the left does, it would no doubt be much preferable; but as this is not the case, and as, by simply directing the left forwards, through rotation of the wrist, just before its admission within the uterine cavity, we can, without much difficulty reach the feet, I am, even in this position, inclined to recommend its employment.

We will suppose, then, we are consulted in a case of this serious difficulty, where the membranes have been ruptured for some hours, the hand protruded externally, swollen, and somewhat livid; the shoulder and chest occupying the brim of the pelvis, and the uterus contracted powerfully around the child's body. Having ascertained the exact position of the fœtus, by the direction of the different parts of the hand, before proceeding to turn, it would be right to make an accurate examination of the abdomen externally; by which we may learn the degree of contraction that the uterus has taken upon itself, and form some opinion of the probable resistance we are likely to encounter.

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* Velpeau, Traité de l'Art des Accouchemens, edit. Brux. p. 388. Conquest Outlines, 1837, p. 128, and others. Blundell, Castle's edit. p. 394, without prescribing any fixed rule, favours this practice.

We also make ourselves acquainted with the general magnitude of the organ, and may judge whether the woman has advanced to near the close of gestation. It is very possible that she may have gone into labour prematurely; and if, on placing the hand on the uterine tumour, we find it so small that it has sunk considerably within the pelvis, we should relinquish the idea of an operation for two reasons: first, because we should be foiled in endeavouring to introduce the hand into so small a space as the cavity under such circumstances possesses; and, secondly, because in all probability the fœtus will pass doubled. Should the patient unhesitatingly inform us that she is persuaded she has not exceeded six and a half, or seven months, we may then almost always trust the case to nature; but beyond that period, an operation will mostly become requisite.

The position and general management of the patient must be such as I have before described. Having taken off our coat, turned up our shirt-sleeve, and anointed the left hand and arm as far as the elbow, avoiding the inside of the fingers and palm, we must kneel by the bed-side, and, forming our fingers into the shape of a cone, we must insinuate them cautiously through the external parts, up to the os uteri; then, laying the hand flat upon the child's person, we endeavour to introduce it either anteriorly or posteriorly, according as the feet lie, sliding it upwards along the fœtal body. It may sometimes avail us, in this step of the operation, to raise the shoulder somewhat from its position; but this is generally difficult to accomplish, and not without its dangers. If the uterus be contracted powerfully, in our attempts to do so we may thrust either our own hand or the child's body through the uterine structure, to the almost inevitable destruction of the patient. We shall find it more easy to pass the hand by the side of the presenting part, than to remove it from the place it occupies by endeavouring to push it upwards; but as the version of the child's body is being effected, the shoulder rises in the same proportion as the breech descends, the arm is withdrawn quite within the vagina, and the humerus is again received into the cavity of the uterus itself.

It is more than probable that the stimulus of our hand may occasion an accession of uterine action, which we are made sensible of, both by the complaints of the woman, and the propulsion of the child's body downwards; we must then, for the present, desist from further endeavours (keeping our hand flatly spread out on the child's body, lest the irregularities of the knuckles might injure the uterus), and resume them in the interval of action. In this way, by little and little,—making progress slowly, but steadily, only pressing forward in the absence of pain, laying the hand extended on the child's person during the return of uterine action, preserving all the advantage we have gained, and being most careful not to withdraw it, we carry it fully within the uterine cavity to that part in which the feet are placed: firmly grasping them both, if they lie together, or one only, if there is any difficulty in finding the other, we tenderly bring the limb down, through the os uteri, into the vagina. If the fœtal body be closely embraced by the contracted uterus, and especially if the shoulder be at all wedged in the brim of the pelvis, we shall find that although the foot descends into the vaginal cavity, still the shoulder does not recede, and the child does not perform the necessary version, to allow the breech to pass down so as to occupy the pelvis; and the greater exertion we make to draw the foot outwards, the more firmly does the shoulder become impacted in the pelvic brim. It is evident, then, unless we can raise the shoulder, that we shall not procure a space into which the breech can descend; and if we endeavour to push the upper part of the child's body out of the way, while we are using no extractive power to bring the breech down, we shall not only not succeed in our endeavours, but the foot will escape back again into the uterine cavity. Now, as the vagina is not sufficiently capacious to admit both hands at the same time,—with one of which we might raise the shoulder, and with the other draw down the breech, by means of the leg,—it will much assist us to get a noose of strong tape fixed round the ankle, while still in the vaginal cavity; nor shall we find much difficulty in the adjustment; and when applied, traction downwards, in a line tending towards the coccyx, may be made by it, while a steady pressure upwards is exerted by the extremities of the fingers placed against the axilla or the ribs. By this double effort the shoulder can be raised,—although that was impossible before the leg was brought down,—because room is made for its recession by the descent of the breech, while at the same time a space is formed for the reception of the breech by the ascent of the shoulder. The breech, then, having been made to occupy the pelvis, the case is reduced to one of the first order of preternatural cases, and must be managed by the rules before inculcated.

No attempt, however, must be made to bring the breech into the pelvis, *except in the interval* of uterine contraction; for it is evident, if traction be applied to the limb at a time when the uterus is strongly compressing the fœtal body, not only that *version* will be attended with more difficulty, but that greater risk will be run of the irregularities of the fœtal members injuring the uterine parietes, than if the change in position were undertaken when the organ was in a state of inactivity.

But when the breech has taken full possession of the pelvic cavity,—the head and shoulders having receded towards the fundus uteri,—whatever extractive effort may be requisite to withdraw the child should be had recourse to, *while the uterus is acting;* because the contraction much assists our manipulations, in our attempts at extraction; and because the chance of the uterus being left in a flaccid state after delivery is then greatly lessened.

I freely confess, that sometimes it is most difficult, if not impossible, to introduce the hand so high into the uterus as to arrive at the feet, because they may lie at its very fundus, and it may be dangerous to attempt to overcome the strength of the contraction which the uterus has taken on itself. It has happened to me, in working the hand along the body of the child, to have passed it as far as the breech, to feel the legs doubled up, but not to be able to reach a foot. In such a case I have not thought it right to make a strenuous effort in order to encompass the feet, but have satisfied myself with hooking a finger in the ham, and making the child revolve by the power that purchase afforded. It must not, however, be overlooked that this practice is far from being unattended with danger; because an arm may be mistaken for a leg,—the bend of the elbow for that of a knee; and it would be unsafe for any one to have recourse to it, until his experience enables him with certainty to discriminate the one limb from the other.*

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* Campbell (Mid. p. 286) recommends, in all cases of turning, that one of the knees should be grasped instead of the feet, as was first proposed by Dr. Breen, Edinburgh Med. Surg. Journal, vol. xiv. p. 30.

Dr. Simpson also (Clinical Lecture, Monthly Journal of Med. Science, Feb. 1845, p. 112; see also Obst. Mem. vol. i. p. 633), recommends that *one knee* should be brought down, in preference to *one foot or both;* and he advises that we should make traction by the knee belonging to that side of the body opposite the presenting shoulder, which we shall find to be the one that lies highest in the uterus. That *turning* may be accomplished more readily by hooking a finger in the ham than by grasping a foot,—because we then obtain a purchase nearer to the breech, which is the part we wish to move,—I believe; and the chief objection to this practice consists in the difficulty of discriminating between the knee and the elbow, in consequence of the similarity in feel between these two parts. Simpson, indeed, says that it is easy to distinguish the one from the other, because the salient angle of the knee is always looking towards the head of the child, while the salient angle of the elbow points to the pelvic extremity. This may be true enough in the case of a man accustomed to operate with his hand in the uterus; but it can scarcely be supposed that any one attempting to turn a fœtus for the first time would pause to consider towards which extremity of the trunk the salient angle of the limb he had hold of pointed. He is much more likely to bring down that which his hand first embraces. It would be much more easy for him to distinguish between a hand and a foot, than between a knee and an elbow; and, therefore, my advice is for him to seek one or both feet. I would recommend him also not to embarrass himself by searching for that limb opposite to the presenting side, but be content with whichever of the two he arrives at with least trouble; because it is desirable that the hand should not be retained in the uterus longer than is absolutely necessary; and because, unless the uterus be compressing the child's body in an inordinate degree, the breech may be made to occupy the pelvis in all cases by bringing down the foot, provided only the traction be made in the proper direction, which most usually would be downwards and backwards in the axis of the pelvic brim; though this must in a great degree

By placing the patient fully under the influence of chloroform, we may in all probability render the operation of turning under a contracted uterus more easy than it would be without the aid of the vapour; and in such cases its employment may be not only admissible but desirable. The woman may be saved much suffering; and the action of the uterus,—as Dr. Snow has reported in the three cases above referred to,*—may be so moderated, that the obstruction which it offers to the passage of the hand may be greatly lessened.

Spontaneous evolution.—It was a remark first prominently set forth by Denman, that occasionally, under a shoulder presentation, after the membranes had been broken some time, the uterus acting with considerable energy, the body was forced down into the pelvis, and an unassisted termination of the case occurred, the breech being expelled first. To this peculiar change of position, effected by nature, he gave the term "spontaneous evolution;" and he has supplied us with his idea of the mode in which it occurs in the following passage: †—"I presume that, after the long-continued action of the uterus, the body of the child is brought into such a compacted state as to receive the full force of every returning action. The body, in its doubled state, being too large to pass through the pelvis, and the uterus pressing upon its inferior extremities, which are the only parts capable of being moved, they are forced gradually lower, making room, as they are pressed down, for the reception of some other part into the cavity of the uterus, which they have evacuated, till the body turning, as it were, upon its own axis, the breech of the child is expelled, as in an original presentation of that part." He afterwards says,—"Premature or very small children have often been expelled in a double state, when the pelvis was well-formed, or rather more capacious than ordinary; but this is a different case to that which we are now describing." The ideas that Denman had formed of this unusual occurrence were generally received by the profession as the true explanation, until Dr. Douglas of Dublin, in a pamphlet first published in 1811, showed clearly that the description was incorrect. He observes, "that it is incompatible with the received ideas of uterine action to suppose that the uterus, when contracting so powerfully as to force down that part

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depend on the original situation of the fœtus. I have myself sometimes accomplished version by hooking my finger in a ham, and in one instance, when the irregular action of the fibres of the fundus prevented my arriving at the foot, after having passed my finger round a ham, not possessing sufficient power to cause the child to revolve, I directed a small blunt hook by the side of my finger, and keeping the point well guarded, made traction by it, and accomplished my purpose; but such a proceeding must be attended with no small risk.

* Vide p. 191, note.

† Introduction to Midwifery, chap. xiv. sect 8.

of the child which was at its fundus, could at the same moment form a vacuum, into which another portion, already low down in the pelvis, should recede."* Dr. Douglas, then, first gave us a true history of the process; and he has proved that the fœtus actually does pass the pelvis in a doubled state, although denied by Denman. He has described it, as being accomplished in the following manner, which indeed I myself have witnessed:—By the continuance of the powerful uterine contractions, the whole of the arm is protruded externally, the shoulder and chest being propelled low into the pelvic cavity. The acromion then appears under the symphysis pubis; and as the loins and breech descend into the pelvis at one side, the apex of the shoulder is directed upwards towards the mons veneris. Further room is thus gained for the complete reception of the breech into the cavity of the sacrum, and that part of the child's body is eventually expelled, gliding along the sacrum, and distending the perineum to a vast extent. As, during the whole of this process, the head remains above the pelvic brim, it is evident that, the apex of the shoulder being external, the clavicle must be strongly pressed against the under surface of the symphysis pubis: on which point, indeed, the fœtal body partially revolves, as on an axis; the other shoulder and arm, and the head, being expelled last. (Plate 74.)†

We cannot reasonably expect this doubled expulsion to occur, unless the patient possess a larger pelvis than ordinary, or unless the fœtus be preternaturally small or premature; nor, indeed, except under a long continuance of powerful and expulsive pains. But the knowledge of the fact, however rare its occurrence, must be considered of much importance practically; for if we saw good reason to believe that delivery was likely to be effected in the manner just detailed, we might be inclined to leave the case to the unaided efforts of nature, and hope for a fortunate termination.‡

But another practical advantage has been also gained by observing the phenomena that I have mentioned—namely, the

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[*] Explanation of the real process of the "Spontaneous Evolution of the Fœtus," 1819, p. 27. Antony Everard seems to have been the first who described a case of "spontaneous evolution." It happened in his own wife's third labour, and she had gone to her full time. The book in which the case is mentioned, a very scarce 12mo., is entitled "Novus et Genuinus Hominis Brutique Animalis Exortus." It was printed at Middleburgh in 1661; and the notice will be found at p. 260.

[†] The pelvis is represented filled by the chest and abdomen of the child; the left shoulder below the symphysis pubis; and the breech entering the cavity within the left ilium.

[‡] I have personally known seven cases of this description, in all which my assistance was desired; and I was present at four of them during the expulsion of the fœtus through the outlet of the pelvis. Three of the children were born alive; two were the second of twins: all the rest, except one, (which was at full time,) were premature, being expelled between the sixth and seventh month.

institution of an operation in which the process may be imitated, wherever it is found impossible to deliver by the more ordinary method of turning; and this consists in diminishing the bulk of the fœtal body by the removal of the viscera; an opportunity being thus afforded for it to collapse, so that it may be extracted with facility.

Exvisceration.—It must not be imagined that the operation of exviscerating the fœtus is intended to supersede the practice of turning under transverse presentations. It is only to be had recourse to as a last resource, when many hours have elapsed since the rupture of the membranes—when the fœtal body is so firmly wedged within the pelvis, or at the brim, that the introduction of the hand into the uterus is rendered impossible, or would be evidently attended with most imminent danger.

In modern times this operation was first recommended and practised by Dr. John Sims,* of London, and Dr. Joseph Clark,† of Dublin; but neither gave any precise rules respecting it, contenting themselves with endeavouring to get the fœtus away piecemeal in any manner they could. In itself it is not difficult of performance, and requires merely the use of the same instruments employed for perforating and extracting the head. The woman lying on her left side, an assistant should be directed to bring the chest as fully into the pelvis, by traction at the arm, as possible; the perforating scissors, guided by two fingers of the left hand, should be carried against one of the intercostal spaces, and a free opening made. (Plate 75.) One or more ribs may be divided, if necessary, so that two or three fingers can be introduced within the aperture. Through this incision the contents of the fœtal thorax must be extracted; the diaphragm may be perforated afterwards, and by the same opening the liver and intestines evacuated. The body, thus deprived of the principal part of its contents, will collapse; and if the uterus continues to act with vigour, will be expelled doubled, the breech following the curve of the sacrum and perineum. But should the pains have ceased, or be inefficient, artificial extraction may be most beneficially made by means of the crotchet carried through the opening, and fixed within the fœtal ilium; the breech will soon begin to descend, and the case will be terminated as though Nature had expelled the child unaided.

Decapitation.—Another means of delivery under transverse presentations, when turning is impracticable, is afforded by the division of the cervical vertebræ, and the separation of the head from the trunk. This operation, as well as that last described, I

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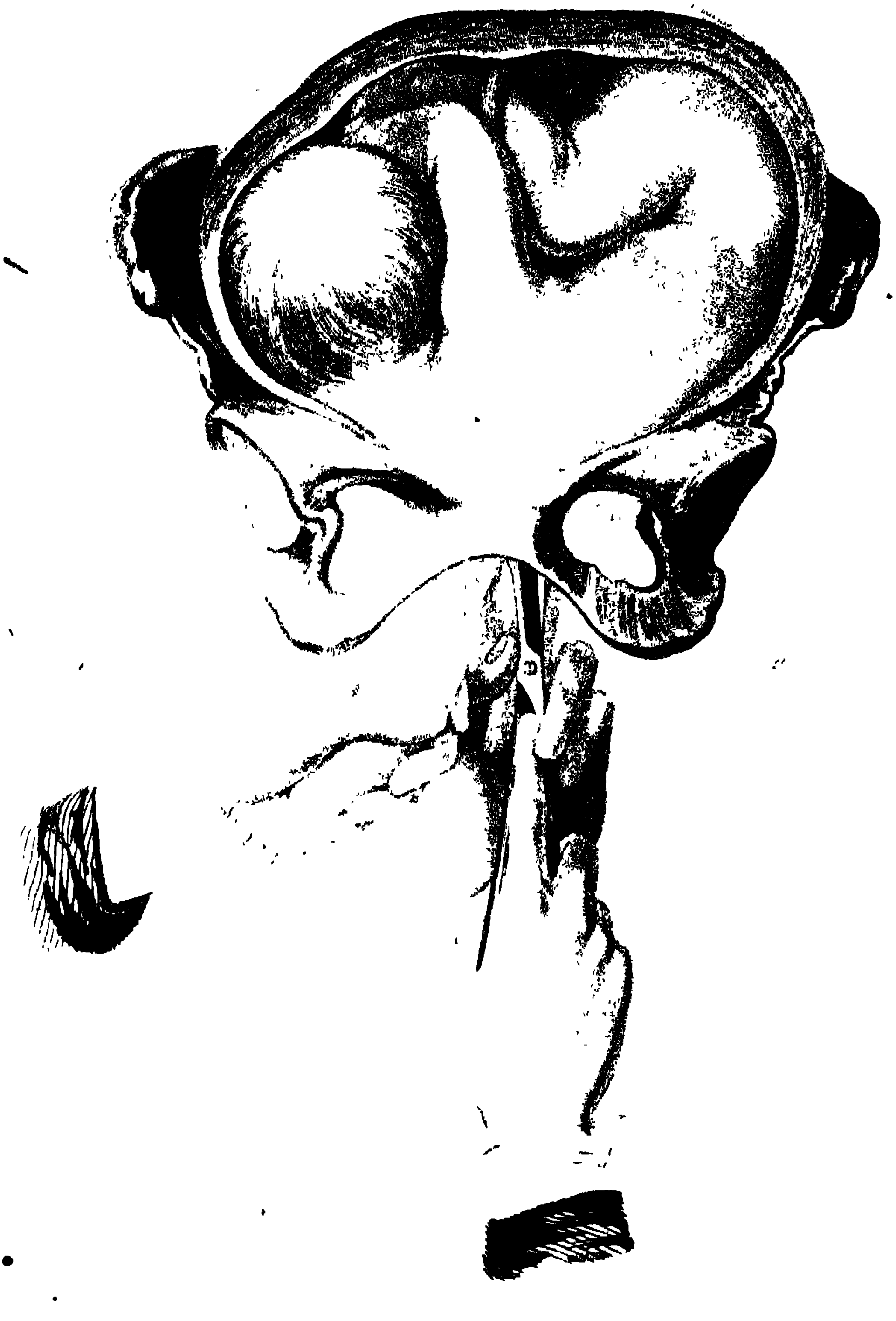
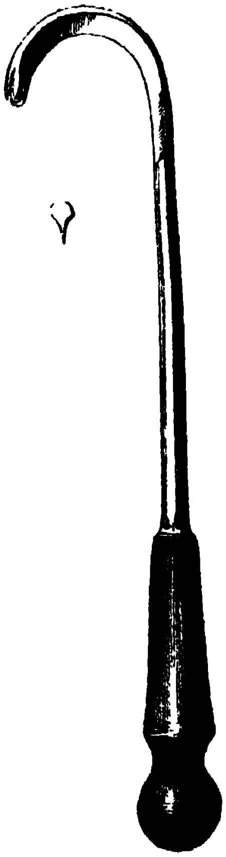
* See London Med. and Surg. Journal, vol. vii. p. 481, June 1802.

† Same Journal, vol. viii. p. 394, Nov. 1802. Also, Transactions of Association of Members of King's and Queen's College, Ireland, 1817, vol. i. p. 377.



have myself had recourse to, and have found the difficulty by no means great. The best instrument for its performance is a hook with an internal cutting edge, formed by my father; and the following is the method of using it.

The finger having been carried as high over the neck as possible, must guide a large-sized blunt hook around it, and the presenting part must be brought as low into the pelvis as is consistent with the woman's safety. An assistant must then steady the blunt hook; the decapitator must be directed over the neck by its side, and,—the first adapted instrument having been withdrawn,—a sawing motion must be given to the cutting hook by the right hand, while the first or second finger of the left is kept steadily in contact with its blunt point. (Plate 76.) It will soon be found that the structures give way, and that the separation is effected. The child's body must then be drawn out by whichever arm may protrude, and the head extracted by a crotchet or blunt hook introduced into the foramen magnum, or the mouth; nor will its removal generally offer much difficulty, unless the pelvis be contracted in its dimensions. But should a sharp hook not be at hand, or should the neck, resisting the efforts made at dividing it, remain entire, a blunt hook being carried round it, as before directed, and the part brought down by an assistant as low as the safety of the woman's structures will permit, the point of Smellie's perforating scissors, carefully guarded by the two first fingers of the left hand, may be placed against the lowest part of the neck, and by a boring motion the skin and the ligaments between the vertebræ may be lacerated, and the instrument carried onwards until it touches the hook on the other side of the neck. The transverse processes may be separated without any great trouble, and the sharp hook, if it has been used, will then cut its way through the muscles and integuments; or, if a blunt one only has been employed, the division of the soft structures may be cautiously made by the scissors. In two cases where I found a difficulty in severing the head by my father's hook, I succeeded in effecting my object quite satisfactorily by the scissors in the manner just detailed: but this mode of acting requires extreme caution, lest the



Dr. Ramsbotham's decapitating hook. The small figure shows a section of the cutting portion of the blade.

points of the scissors should slip to one side, under which mischance grievous injury might be inflicted on the woman's person.

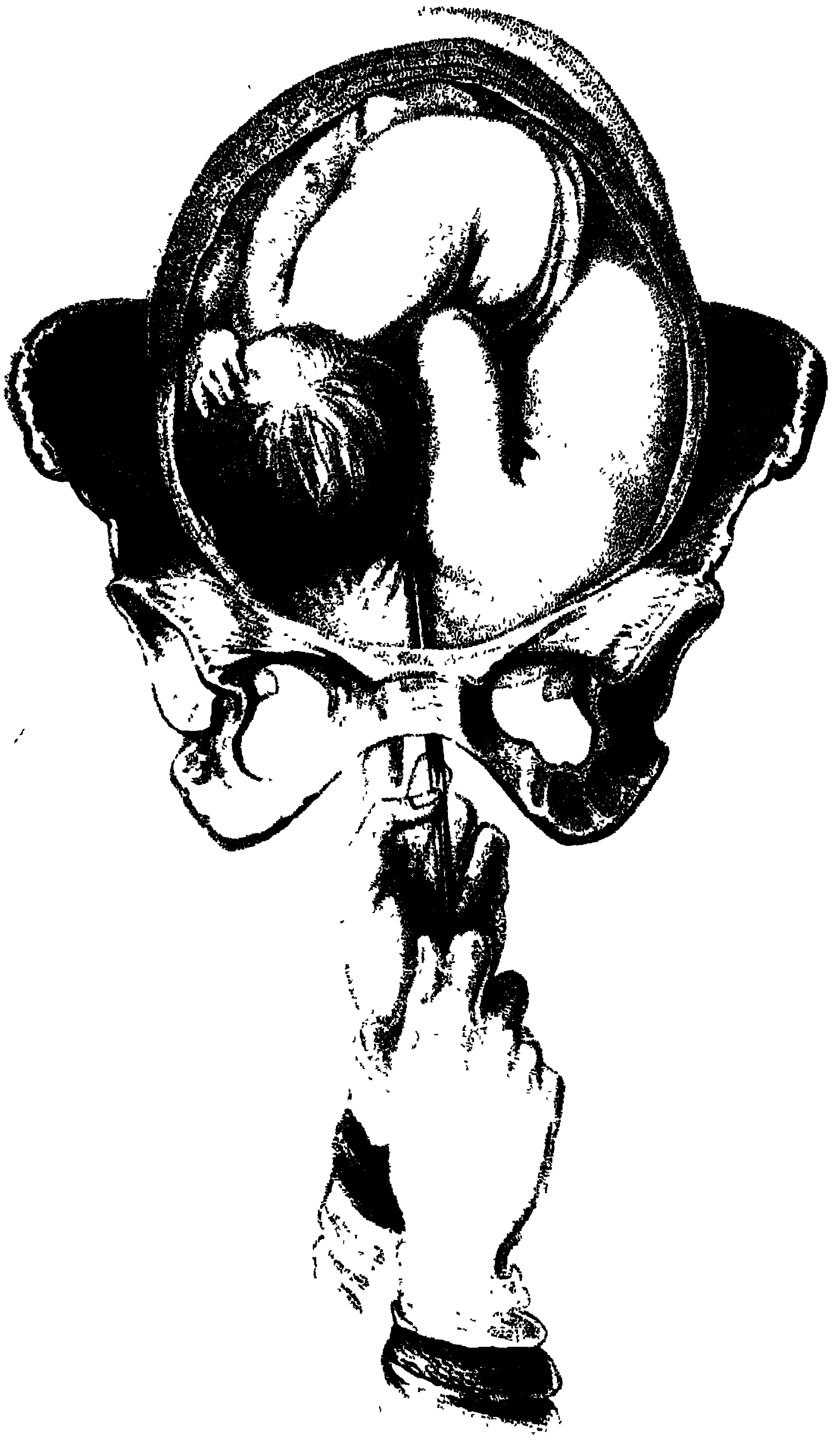
I can scarcely suppose it possible for any case of transverse presentation to occur, which might not be terminated by one or other of these operations, provided turning could not be accomplished;—unless, indeed, the pelvis be distorted in an extreme degree, or almost fully filled by a solid tumour. For if the chest be much pressed downwards, occupying a large portion of the pelvic cavity,—although it would be difficult to surround the neck so as to amputate the head,—perforation of the thorax would be easy, and delivery could be perfected through its means: while if the child presented, as occasionally happens, with the doubled neck directly over the pelvic brim, then there could be little trouble in passing the finger round that part, as a guide to the cutting hook; although to perforate the chest under such a presentation would be dangerous, if not impracticable.[*]

I can fully appreciate the horrifying feelings with which the reader must be impressed, whilst contemplating the details of two operations apparently of the most barbarous and savage nature—the shudder which he must experience on finding any person hardy enough calmly to sanction and advise the decapitation, or disembowelling of a fœtus in utero. Surely, however, I need not add, that such modes of delivery should never be thought of unless the fœtus be dead; nor, indeed, can they ever be necessary until life is extinct; for if the chest be so firmly impacted in the pelvis as to prevent the introduction of the hand into the uterine cavity, the pressure to which the heart itself would be subjected must destroy the existence of the fœtus, independently of the great chance that fatal compression will take place on the umbilical vessels, both in the cord, and after their division upon the placenta, so that our feelings on that account can never be wounded.[†]

[*] Plates 75 and 76 show the mode of performing these two operations. A front view of the pelvis is given in both the illustrations; but it must be remembered that in practice the woman must be placed on her left side.

[†] Neither of the operations described in the text are of modern invention. Celsus, (lib. vii. cap. 39,) speaking of transverse cases, where the child cannot be turned either with the head or feet towards the os uteri, says—"Remedio est cervix præcisa; ut separatim utraque pars auferatur;" again, "aliæque etiamnum difficultates faciunt, ut, qui solidus non exit, concisus eximi debeat." Ætius also (tetrab. iv. sermo iv. cap. 22) says of all transverse presentations, that of the abdomen is the least dangerous or difficult. "Eo enim a nobis dissecto, et interaneis exemptis, considente corpusculo, facilis est figuræ transmutatio." In the twenty-third chapter too from Philumenus, we find: "Si verò duplicatio pertinacior fuerit pedibus magis expositis, caput circa coarcticulationem ad vertebram amputetur, deinde transgresso thorace, pedes attrahantur." And in Heister, on the same subject, (Institutiones Chirurgicæ, pars ii. sect. v. cap. 153, parag. 7,) we read, "Igitur tunc, ex Celsi jam dato consilio consultius esse puto, pectus atque abdomen infantis, vel digito, vel forfice acuto, vel

PLATE LXXVI



Many of the ancient writers* recommend that when the arm is protruded externally, it should be amputated at the shoulder joint: this practice has been pursued in late days; and I have known instances in which it has been carried into effect. From such a recommendation, however, I most strenuously dissent, because the removal of the arm cannot, in the slightest degree, avail us in furthering delivery, and because it has been followed by the most distressing consequences. Thus Chapman † gives an instance in which the attendant, supposing the child dead, amputated its arm while in utero; it was afterwards born alive, and grew up to manhood. ‡

While there is a possibility of the infant surviving such serious mutilation, it would be in the highest degree injudicious, not to say criminal, to practise it: but another valid reason would induce us to banish the operation;—that the dismemberment of the child,

unco adhibito, providè aperire, extractisque visceribus, atque intestinis, vel et costis nonnullis, videndum, an corpore hunc in modum extenuato, propiùsque ad collum uteri accedentibus clunibus, pedes reperiri, iisque repertis, sic tandem protrahere fœtum liceat: *id quod semper, quoties hoc feci, feliciter mihi successit.* Si qua autem forte pedes nondum apprehendi queunt, tum *clunes protinùs a subjecta manu comprehendi, supràque in eosdem immisso unco protrahi debent.*" This embodies the principal features of our present practice in these difficult cases. And in parag. 9 of the same chapter, "Hoorneus* sæpè laudatus adhuc peculiarem novum, cumque breviorem modum, fœtum mortuum cum brachio arctissimi in vagina uteri hærente, invenit atque descripsit: qui in eo consistit, ut quando ad pedes pervenire nequit, *collum*, utpote qui in fœtibus valdè adhuc tenerum est *vel scalpello a reliquo trunco resecet vel unco idoneo*, quàm cautissimè auferat."

* Ætius, tetrab. iv. sermo iv. cap. 22 et 23.—Heister, cap. 153, parag. 6, says, "Si vel propter nimìs tumidum brachium, vel propter uterum nimis constrictum, manus chirurgi in uterum demitti nequeat, *vel extorqueri ex scapulæ articulo*, vel quàm cautissimè *rescindi brachium juxta humerum oportebit.*" Saviard (Obs. in Surgery, translation, 1740, p. 189) details a case of arm presentation, the child being putrid, in which he first took off one arm and then the other, "but this separation affording no more room to reach the feet, because of the doubled situation of the child," he separated the head from the body; the case occurred in the Hotel Dieu, Paris, in June, 1691.

† Treatise on Midwifery, 1759, p. 113. See also Chamberlen, lib. ii. chap. 12.

‡ A case of even more aggravated nature occurred in France in the year 1829. A practitioner at Chenu, in the department of Orme, removed both the arms of a child which were protruded together, swollen, and livid, after having made vain attempts to turn: no blood flowed, but the infant was soon born alive; and surviving the mutilations, the wounds speedily healed. The father brought an action against the attendant; and the tribunal, before which the case was tried, referred the matter to the Royal Academy of Medicine for their opinion. A committee of five gentlemen were appointed, consisting of MM. Desormeaux, Gardien, Deneux, Adelon, and Moreau; and they drew up a report, strongly censuring the defendant; but it met with much opposition when discussed in the Academy, and was returned to the committee for re-consid[illegible]. A second time their answer was of the same tenor, though not conveyed in [illegible]g language. Whether any or what punishment was awarded by the tribunal for this malpractice, I am ignorant.—(Lancet, April 4th, 1829.)

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* He refers to Van Hoorne, who was professor of anatomy and surgery at Amsterdam; and was afterwards, in 1653, elected to the same chairs in the University of Leyden.

in the manner described, can seldom be of the least service in facilitating the delivery of the patient; for I have before stated that it is not the arm, partially occupying the vagina, which prevents the entrance of the hand into the womb, but the shoulder impacted in the pelvic brim, and the uterine parietes strongly embracing the child's body. Besides, when the arm has been separated, such a confusion of parts is produced as to render it difficult to discriminate between the fœtal and maternal structures; and should it afterwards be found necessary either to perforate the chest, or separate the head from the trunk, we have lost the means of traction which the arm afforded, and which assists us materially in our operation. For all these reasons, then, the custom of amputating the protruded limb is both unnecessary and unwarrantable.

A transverse position of the fœtus may be complicated with a pelvis distorted to such an extent as to preclude the passage of the hand into the uterus for the purpose of rectifying its unfortunate situation; or so small as to prevent its extraction, even if the necessary evolution could have been accomplished. In such an extreme case, the Cæsarean section affords the only possible means of delivery.

COMPLEX LABOURS.

THE class COMPLEX LABOURS embraces eleven orders; not, however, included under one head because of any analogy that they bear to each other, but merely to prevent the embarrassment which might arise from a multiplication of separate and distinct classes.

These are—

First, labours complicated with hæmorrhage;

Secondly, with convulsions;

Thirdly, with ruptured uterus;

Fourthly, with lacerated vagina;

Fifthly, with ruptured bladder;

Sixthly, with syncope, independently of hæmorrhage, or any extensive laceration or other lesion;

Seventhly, with descent of the funis by the side of the head or breech;

Eighthly, with the descent of the hand by the head or breech;

Ninthly, labours in which monsters are brought forth;

Tenthly, where there is an excessive quantity of liquor amnii;

And, *Eleventhly,* in which there is a plurality of children.

Hæmorrhage during labour.—Hæmorrhage is by far the most frequent source of danger to the parturient woman;* and since it is so common in occurrence, so alarming in its nature, and fatal in its effects, this accident calls for the most anxious and serious attention.

It must be borne in mind that all profuse hæmorrhages during parturition, and towards the close of gestation, are to be regarded as originating in a partial detachment of the placenta from the uterine surface, and the consequent opening of a certain number of vascular orifices. For although some physiologists † have supposed that the vessels which communicate with the decidua might, when a portion of that membrane became loosened from its uterine connexion, furnish a sufficient quantity of blood to constitute an alarming discharge, I cannot think but that they have overrated the consequence of such an accident; and that, during the last few weeks of pregnancy at least, we should attribute all dangerous flooding to a partial separation of the placental mass itself.

It is a common observation, and in a great measure true, that the earlier in gestation hæmorrhage occurs, the less danger does it generally bring with it; so that an attack of flooding coming on, either near the full period of pregnancy, or during the progress of labour, is by far more frequently fatal than in the more early weeks. This is owing to the large quantity of blood that may flow in a short space of time, in consequence of the enormous size which the vessels have acquired towards the close of pregnancy. It has been shown that, as the uterus enlarges in bulk, and its cavity increases in extent, the blood-vessels also undergo a gradual dilatation in their calibre, and that, at the end of gestation, the arteries have acquired a capacity sufficient to admit the barrel of a goose-quill without any difficulty, and the veins a cylinder of even greater diameter.

It must also be noted, that hæmorrhage from the uterus, under labour, is of a passive character; and the blood escapes, not as a consequence of any forcible rupture, produced by the excessive action of the heart and arterial system,—as is for the most part the case in hæmoptysis,—but merely by being allowed to exude through orifices rendered patulous by the separation of a substance which had previously closed them; and that, therefore, when the flow is immoderate, our treatment must necessarily be directed towards preserving within the body as much of the vital fluid as possible.

Although a large loss of blood is always greatly to be dreaded, yet in practice we do not so much regard the quantity that flows, as the effect which the loss produces upon the constitution of the patient; because we find that different women vary very remarkably in their capabilities of bearing up against the results of hæmorrhage. It is surprising to notice how slight a degree of depression will follow an excessive flooding in some women; and how small a discharge will destroy others. I have known two women die from the eruption of scarcely a pint of blood; and I have seen others recover perfectly when they have suffered the loss of some quarts; so that the quantity which would constitute a dangerous hæmorrhage in one constitution, would in another not even produce alarm.

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* See in Appendix P., deaths from puerperal causes.

† See Burns's Midwifery, 5th edition, p. 287.

Besides the quantity of blood lost, the danger to the patient depends also on the celerity with which it flows. If a pint escape at one gush, it is usually followed by a state of faintness, and perhaps complete syncope; but a slow draining may go on for a considerable time, until, in the whole, many pounds may have oozed away, with but little constitutional disturbance; and this difference may depend on two circumstances:—In the first place, the arteries throughout the entire body, by the power of contraction inherent in their own structures, accommodate themselves in diameter to the decreased quantity of their contents; and this diminution in calibre they have an opportunity of effecting when the blood drains away slowly, but not when it passes out with greater rapidity:—and secondly, at the same time that the discharge is going on, fresh blood is also formed by the assimilation of nourishment; and thus the deficiency is in part at least supplied, and a more equal balance is kept up.

But although the immediate effect on the constitution is not so great, still we must look with much anxiety on these continual drainings, for they will in time undermine the most robust habit; and I have remarked, that women usually recover better when a small quantity has suddenly broken forth in one eruption, than when they have lost a larger quantity more slowly; although, in the latter case, they may have experienced but little comparative distress at the time the blood was flowing. Dropsies, purgings, affections of the chest, and organic diseases of the abdominal viscera, have more frequently followed a draining continued for a length of time, than one sudden gush, notwithstanding that the violence of the shock in the latter case may have produced a state of syncope that was alarming at the moment. The danger then will partly depend on the quantity lost, partly on the celerity with which it flows; and must be estimated by the effect on the constitution.

When a woman floods in labour, it is very seldom that the discharge will continue with the same impetuosity until death supervenes; but she faints and rallies, and faints again: until at length a perfect syncope will paralyse the senses, deaden the nervous energy, and put a stop for ever to the action of the heart. Occasionally, indeed, one tremendous burst takes place, which so completely depresses the system, that a mortal faint at once occurs. The heart and sanguiferous vessels become so rapidly emptied, that they possess no longer the power of contracting upon their diminished contents, so as to propel them onwards; and thus, after making some vain and futile efforts to keep up the circulation, their action entirely ceases, never to be restored;—though this is comparatively rare. Sometimes, again, a slow draining will go on for a length of time, the faintness increasing with the loss of blood, the heart's action never being perfectly suspended during the continuance of the discharge; and the first attack of syncope will be the last.

Means adopted by Nature to arrest hæmorrhage.—Since, then, bleedings seldom continue uninterruptedly until death takes place, it is clear that a process is established by Nature for the purpose of subduing hæmorrhage. When an artery is wounded, there are four principal ways by which Nature endeavours to put a stop to the immediate flow of blood; and a fifth, by which she renders the safety of the patient permanent. The first philosophical attempt to explain Nature's mode of proceeding in suppressing hæmorrhage from divided arteries, was given to the world in 1731 by M. Petit,* who accounted for it on the principle of a coagulum formed around, and at the extremity of the bleeding vessel, extending to a considerable distance within the cavity of the canal, lying partly within, and partly externally; and thus offering a barrier to the free flow of blood. This opinion was in a few years commented on by Morand,† who was afterwards followed by Sharp,‡ Kirkland,§ White,|| Gooch,¶ and others. These physiologists, although they in part subscribed to Petit's doctrine, insisted that the chief cause consisted in a change which the artery itself undergoes; that change was severally described as being a corrugation, or plaiting of the circular fibres of the vessel, by which its calibre is directly diminished, together with a shortening, a corresponding thickening of its longitudinal fibres, and a retraction of the open mouth, which were all supposed indirectly to assist in contracting its canal. The third opinion was advanced by Pouteau,** who attributed it to the swelling or thickening of the cellular substance surrounding the artery; and lastly, the late

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* Mem. de l'Acad. Roy. des Sciences.

† Mem. de l'Acad. Roy. de Chirurg., vol. v. 8vo. edit. He refers it to the *crisping* or curling of the vessel, "*crispation du tuyau.*"

‡ Operations in Surgery, 2nd edition, 1739.

§ Treatise on the Method of Suppressing Hæmorrhage from divided Arteries, 1763.

|| Cases in Surgery, 1770.

¶ Chirurg. Works, 1766.

** Mélanges de Chirurg. 1760.

Mr. John Bell [*] asserts, that "when hæmorrhage stops of its own accord, it is neither from the retraction of an artery, nor the constriction of its fibres, nor the formation of clots, but by the cellular substance which surrounds the artery being injected with blood;" and he supposed the pressure thus occasioned to be the cause of the suppression of the bleeding.

More extended observation has taught us that each of these means contributes its due share towards the object which Nature has in view; and we now consider that the flow is restrained for the time, partly by the extremity of the vessel contracting, partly by its retraction within the surrounding cellular substance, partly by blood effused into that cellular substance, and partly by a conical-shaped clot formed at its extremity, and passing to a considerable distance within its canal. But it must be evident that such slender safeguards, even when acting under the most favourable circumstances, can only exert an influence for a limited period, and that there must be great danger of renewed bleeding on the application of many trifling exciting causes. Nature, then, not content with the insufficient security obtained through these means, has instituted another process, by which the perviousness of the canal is permanently destroyed. The divided extremity of the artery inflames, its *vasa propria* pour out lymph, which, adhering to the internal coat of the vessel, fills up the cavity, and eventually obliterates the canal. Its coats also become thickened by a similar process—namely a deposition of lymph within their structure; by which two conjoint actions the vessel is converted, in process of time, into a ligamentous cord; and this change is usually observed to have taken place as high as the first lateral branch given off above the seat of injury.

It is an established principle of improved surgery, in cases where an artery is pricked, and cannot be secured, to divide it completely across; by which means the best chance is afforded it of diminishing its capacity, of burying itself within the surrounding cellular structure, and of becoming plugged at its cut extremity by the formation of a clot.

From observing these wonderful expedients adopted by Nature, and the changes she has instituted, modern art has derived a most valuable lesson; and the surgeon now throws a ligature around the sides of the canal, which at once renders it completely impervious, in the same manner that Nature attempts through the medium of a coagulum of blood: and the process of adhesion and consolidation afterwards advance in even a more rapidly progressive manner.

To apply this to our present purpose, let us examine if there are any means analogous to those just described, by which Nature or art can restrain hæmorrhage from the uterus under labour. If the arrangement of the uterine vessels be as I have described it; *—if instead of ending in open mouths,—the arteries, having followed for a considerable distance a tortuous course, eventually terminate in veins, which have circular or oval apertures at their sides, it is impossible that the denuded vessels could retract, and bury themselves within the surrounding parts: they might indeed be compared to the punctured vessels of a limb. Even if the arteries opened upon the placenta by patulous extremities, as the Hunterian doctrines teach, there is so small a quantity of loose cellular substance in the uterine structure within which they could retreat, that we can hardly expect either *contraction* or *retraction* to assist us in this emergency.

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[*] Principles of Surgery, 1826, vol. i. p. 250.

I am not prepared to say that *coagulation* does not occasionally take place at the vascular apertures opened on the separation of the placenta; on the contrary, indeed, I have had frequent proofs that it does, and that it is some safeguard against the continuance of hæmorrhage; † but still it is a very poor one, and one upon which we are not warranted in relying, provided there are any other means which we can ourselves put in practice. Nor am I exactly prepared to say that *consolidation* of the vessels by coagulating lymph might not perhaps occur; but we should not *à priori* expect it, because the occasion of its deposition, in a divided vessel, is the inflammatory state set up as a consequence of injury. In the separation of the placenta from its uterine attachment, however, there is no solution of the continuity of the vessel itself—there is no injury sustained by it—and we cannot, therefore, with any show of reason, anticipate the occurrence of adhesive inflammation. But even presuming that it was possible for a consolidation of the bleeding vessel to occur to the fullest extent, still the process must occupy a considerable time; Nature cannot effect it at once;—in hæmorrhage under labour, death must occur before even it could be commenced; consequently it cannot be considered as a means of preservation.

But independently of the formation of coagula—independently, if it were even possible, of the consolidation of the trunk of the vessels, and their retraction—Nature arrests uterine hæmorrhage under labour by means as sure, as powerful, as effective, nay even more so than the silken ligature of the surgeon, and almost analogous to it:—namely, by the contraction of the uterine fibres. The blood-vessels have been described as circulating through the uterus in a most tortuous manner, intersected and surrounded by the uterine fibres in the form of a complicated net-work. When the fibres of the uterus contract, the vessels are closed by the compression; and it is to this admirable contrivance, to this incomparable system of "living ligatures," that all women owe their safety after delivery. This arrangement of Nature possesses a decided advantage over the art of the surgeon; because not only is the trunk of the vessel closed at one point, of a line's breadth, but the compression extends along the whole of its canal. We must ever bear in mind, that it is to uterine contraction alone we are to look for the ultimate safety of every woman from flooding after the child's birth: were it not for this contraction, she must inevitably die.

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* Page 72.

† The excess of fibrine that exists in the blood of a pregnant woman no doubt tends to favour coagulation.

Symptoms.—The symptoms which accompany uterine hæmorrhage under labour, are those of bleeding in general. The pulse becomes quick, small, feeble, indistinct, and fluttering; the breathing becomes hurried and laboured; the respiration is drawn with sobs and sighs; the voice falters: the countenance is pallid; the lips exsanguined; the eyes glassy and lustreless; the extremities cold; and a cold perspiration breaks out on the neck, face, and forehead. The pulse, by degrees, becomes more feeble and indistinct, and at last fainting supervenes. During the continuance of this faint, the patient remains motionless, and the pulse at the wrist is not to be felt at all perhaps, or at the most is beating very languidly. The heart's action is also enfeebled, or possibly suspended for a few strokes. After an uncertain time, the pulse is again to be felt; the breathing is more natural; the lips and cheeks partially regain their beauteous tinge, and the eye a portion of its fire; the extremities and the general surface become warmer. With a return of animation—with a restoration of arterial action—occurs a return of the bleeding; and the patient rallies, only to contend with fresh and increased dangers. Again the pulse flags; again she sobs and sighs; again there appear the ghastly face and sunken eye; again animation is suspended; and usualy the second faint is more intense and longer than before. She may recover a second and a third time, with powers still further depressed; and now possibly restlessness will take the place of quiet. At first she throws her arms about, tosses off the bedclothes, cries out for fresh air; and then universal jactitation supervenes. No entreaties, and scarcely force, can restrain her in one position, till again she sinks motionless and faint. On recovering after two or three attacks of fainting, there will probably be rigors throughout the whole frame; vomiting may come on: there is great anxiety of countenance and mind;—she is sure she is dying, calls for her husband and her children; and although her fortitude seldom forsakes her, still much dread and solicitude are evident. A sense of constriction of the chest will then appear, as if a cord were tightly drawn around the centre of the body, most probably arising from a spasm of the diaphragm. This suffocating sensation is usually followed by two or three convulsions, and death closes the terrible and agonising scene.

Although these are the general symptoms, and they mostly occur in the order in which I have enumerated them, it is not necessary that they should all show themselves; — rigors and vomiting, for instance, may be wanting; and the time which may be occupied from the first commencement of fainting till death results, varies exceedingly, according to the constitutional strength and several external circumstances. Sometimes, as before remarked, the first attack of syncope carries off the patient; sometimes there are many faintings; and the vital spirit flutters and hovers around the devoted head, as if unwilling to quit a tenement which it has so long inhabited.

Under such a state of distress and danger, the medical man's duty is indeed of the most arduous and harrowing description; to be of service, he must be prompt, persevering, steady, and decisive; and he must continue in the use of his means until the total cessation of the respiratory action proves that life is entirely extinct.

Treatment.—In the treatment of hæmorrhage our duty is twofold: *first*, to restore the patient from the faint into which she has fallen, provided its intensity, or the length of its duration, indicate immediate danger; *secondly*, to prevent a return or increase of the bleeding.

The treatment that we should have recourse to, as a general principle, on flooding occurring during labour, is much the same as that we should employ under hæmorrhage from other organs. There are particular means, indeed, which are applicable to every particular case, and which I shall hereafter mention, when I come to treat of these cases individually; but I shall now speak of our management generally; and, in the first place, let us give our attention to venesection. It was formerly the custom to consider all hæmorrhages, except they arose from accident, as of an active character; and, under this impression, venesection was had recourse to, even in flooding under labour, with a view of putting a stop to the discharge. I have already observed, that we look upon it as a passive hæmorrhage; that it is not produced by the increased action of the heart, causing a rupture of the vascular coats, but is occasioned by the blood being allowed to exude through orifices already rendered patulous: and it must be likened in its character to the bleeding from a punctured wound. If a patient were brought to a surgeon with the radial or ulnar artery, or any other large vessel, divided, would any man in his senses propose to stop the flow of blood by syncope induced by bleeding at the arm?—Certainly not: he would put a ligature around the vessel, and endeavour to save the patient from a greater loss. In a case of placental presentation, however, before any means were taken to accomplish delivery, I have known the lancet used, in the hope of restraining the hæmorrhage, which very act, in a great degree, diminished the woman's previous chance of life.* I do not mean to assert that in very many cases of hæmorrhage under pregnancy, and especially the early stages, bleeding may not be highly useful; but in labours complicated with flooding, it is scarcely ever—nay, I would say never—to be thought of. The cautious surgeon would rarely indeed practise bleeding from the arm while the blood is gushing from the uterus during labour.

Secondly;—We will consider the propriety of exhibiting opium. Opium is held up by many very great authorities as a most valuable means for arresting hæmorrhage, particularly after the child is born, and the placenta has been expelled. Opium takes off muscular contraction, by destroying nervous sensibility; and it also removes uterine action,—the very power on which alone we are to rely for the full and complete closure of the open vessels. Does it not then seem preposterous to use those very means for subduing hæmorrhage, which would take away our only source of safety?—Few men, even its most strenuous advocates, recommend it at the commencement of labour, or before the child is born; and hereafter an opportunity will be afforded of canvassing its merits after the birth is perfected.

Thirdly;—Stimuli. Stimuli are had recourse to for the purpose of rousing the vital energies,—to keep the patient from sinking under the faintness occasioned by the discharge; but their use is dangerous, and they should be avoided, if they can in any way be dispensed with; because, under their operation, the nervous and arterial systems are excited and wound up to a pitch beyond the healthy standard. Thus, as arterial action is increased, the coagulum at the orifices of the vessels, if it have been formed at all, will most likely become dislodged. This plug is to some extent a safeguard, but not one to be depended upon, to the exclusion of other means. It is right, however, to preserve it as long as it answers the purpose of restraining the discharge in any considerable degree. Another reason why we should not unnecessarily have recourse to stimuli is, because it is a well-established physiological doctrine,† that the blood coagulates more readily

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[*] For cases of placental presentation in which the lancet was used, see Portal's Practice, Obs. 41 and 79; also Smellie's cases, collect. 33, No. 2, cases 13 and 14. Stewart (on Uterine Hæmorrhage, p. 48) recommends bleeding, if the patient be plethoric, and not at full time.

[†] See Kirkland, Hewson, Jones, Thackrah, &c.

under fainting, than when the circulating system is in full vigour. This is a singular and most beautiful provision of Nature to sustain endangered life: if, then, we remove the fainting by suddenly increasing the arterial powers, we prevent the deposition of coagula, as well as run the risk of forcing away the plug, even when once formed. Cases, however, are occasionally met with, in which we must have recourse to stimuli;—where we must rouse the patient from the faint into which she has fallen, lest that particular syncope should prove fatal. We have only the selection of one out of two evils offered us; and we must resort to stimuli as a matter of necessity, though not of choice. These means, therefore, are never to be employed, except where danger is immediate and imminent.

Fourthly.—Other remedial agents have been used besides stimuli. The ergot of rye has been much extolled for preventing hæmorrhage; and various papers have appeared from the pens of well-informed and unprejudiced men,* to prove that it will restrain the flow of blood from other parts of the body as well as the uterus. I am not able to speak positively on this subject, with regard to other organs of the body, but it certainly has the power of restraining bleeding from the womb in many of its varieties. Where the uterine fibres are too much relaxed to produce the contraction requisite for the perfect closure of the vessels, we shall find the ergot of rye a most valuable medicine,—much more so, indeed, than opium, whose action is to remove, rather than excite, uterine contraction. The ergot is particularly beneficial in hæmorrhages preceding the birth of the child, and in those after the entire evacuation of the uterine cavity, when it remains in a state of flaccidity,—when the fibres, for want of sufficient tone, refuse to take upon themselves that contraction which is indispensable to the well-doing of the patient.

Fifthly.—Refrigerant medicines, and particularly the mineral acids, are very largely used under uterine bleeding, both during labour and in the unimpregnated state. Mineral acids, it is well known, coagulate albumen; and direct experiments, as well as observations made on patients affected with calculous disorders, prove that they are beyond the influence of the digestive powers, and enter the blood unchanged.* It is reasonable to infer, then, that they may, in no slight degree, favour coagulation, and to this quality we may attribute their efficacy in most passive hæmorrhages. In their power of repressing the more violent discharges, indeed, I have but little faith, and would by no means trust solely to their agency to restrain any copious eruption of blood from the uterus of a parturient woman: but, as they are generally grateful to the patient, and within proper moderation not likely to prove injurious, no objection that I am acquainted with can be urged against their use;—provided too much reliance be not placed upon them, to the exclusion of other more efficient means. The acetate of lead and alum have each of them been much extolled also; and although they may occasionally be had recourse to in uterine hæmorrhage from other causes, they are, in my opinion, inappropriate remedies in those cases of the more copious floodings which we meet with under labour.

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* See the papers by Negri, Medical Gazette, vol. xiii. p. 351 *et seq.*, December 7, 1833. In support of Dr. Negri's views, I may mention that in one case of obstinate epistaxis in which I employed the ergot, the bleeding ceased after the exhibition of two or three doses, although all the means that had been previously tried, appeared unavailing. A physician, now dead, who had been for years subject to occasional attacks of hæmoptysis, informed me that no medicine controlled them in his system so completely as the ergot. He said that he never took more than three doses, and that it never had disappointed him in completely checking the bleeding. He was certainly very susceptible to the action of the remedy, for his usual dose did not exceed eight grains, and if he took more, it produced vertigo, and other unpleasant cerebral disturbance.

Sixthly.—Cold is also a valuable agent, when applied generally, to overcome faintness, and topically, for the purpose both of moderating the flow of blood to the uterine vessels, and exciting contraction in the uterine fibres; and when combined with astringents, its powers seem to be augmented.† In the commencement of the flow, before faintness supervenes, cold may be resorted to almost universally, and without restraint; but its advantage, when the system is much depressed, is more than equivocal: for there is a point beyond which the vital energies cannot bear up against the continued application of cold; and at that point it becomes actually injurious. Some discrimination is therefore necessary in the use of this common and effective agent.

Seventhly.—Pressure on the uterine tumour by a bandage, or, what is better, by the grasp of the hand, is another means of restraining some varieties of flooding, most powerful, daily had recourse to, very generally employed, and open to few or no objections. And the evacuating the uterus artificially is sometimes necessary, though never to be undertaken without grave occasion.

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* See Pereira's Mat. Med. p. 9.

† Cold has a powerful influence in exciting muscular contraction in some organs, and it is equally efficacious in promoting uterine action. Were illustrations requisite, I might instance the sudden desire often felt to evacuate the bladder, on going from a warm room into a chilly atmosphere; and the strong action of the dartos muscle always, with the vehement contraction of the diaphragm frequently experienced in plunging into a cold bath. Cold also constringes the blood-vessels; thus, when we immerse the hand in cold water, its bulk shrinks, from the vessels not admitting the usual quantity of blood. But cold, externally applied, will be found most useful when conjoined with astringents. Most astringents consolidate the fibres of dead animal matter, and excite the living muscle into action; they, at the same time, act upon the blood-vessels in the same manner that cold does; and, perhaps, even more powerfully. The blanched appearance of the lips after the application of vinegar, fully testifies their power in this respect. It is upon these principles, then, that vinegar and cold water are found so efficacious in subduing uterine hæmorrhage.

Eighthly.—We have been recommended, and especially by Leroux,* to plug the vagina in all cases of hæmorrhage under labour; but this practice appears to me—except in some rare complications of placental presentation—likely to be fraught with great hazard; for the uterus, at the full period of pregnancy, by reason of its lax condition, allows itself to be easily distended with coagula; and—while its cavity is sufficiently capacious to contain a large quantity of blood—the source of danger is concealed by that blood being pent up within; as, therefore, the nature of the case may thus be overlooked, the peril into which the woman is thrown is likely to be increased. In hæmorrhages under abortion, indeed, when the cavity of the womb is small, and its parietes incapable of distension to any great extent, the *tampon* will often be found invaluable.

Ninthly.—Puncturing the membranes, and letting off the liquor amnii, is often resorted to in *accidental hæmorrhage* with the most beneficial effects; but this subject requires a deeper consideration than this summary sketch will admit of, and will be considered more at length subsequently.

Tenthly.—The plan of transfusing blood from the system of another person to that of the patient, for the purpose of rousing the dormant powers and of sustaining life under hæmorrhage, has lately been practised in a few cases with success. Dr. Blundell has given us proof that some of the inferior animals can be nourished for a length of time by merely injecting, at proper intervals, into their veins the healthy blood of an individual of the same species: for he preserved a dog alive for three weeks in this manner without food, only allowing it a little water; and in that space the animal was reduced but little more than one-fourth of its whole weight.† From this experiment we may conclude, that the same treatment might possibly be found efficacious in the human subject. As a means of preserving life after large losses of blood, then, transfusion promises to be useful in some rare cases; and if had recourse to in uterine flooding during parturition, we shall find its employment more beneficial when the organ is entirely empty and contracted, than at any other period of the labour. In all cases of hæmorrhage, perfect quietude both of body and mind, and the horizontal posture, are essential to the well-being of the patient.

Hæmorrhage may occur at any stage of the labour; before the liquor amnii is evacuated; after the membranes are ruptured, and before the head is born; after the head is born, while the shoulders are in the pelvis; between the birth of the child, and the expulsion of the placenta; and even after the placenta is expelled, when the uterus is emptied of its previous contents, and when, in the common acceptation of the term, we should consider the labour as concluded.

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* Sur les Pertes de Sang, p. 270, &c.

† Physiological Researches, p. 75. For some notice of the history of transfusion, see Appendix K.

HÆMORRHAGE PREVIOUS TO THE BIRTH OF THE CHILD.—To our countryman, the late Dr. Rigby,[*] we are mainly indebted in this country for a great practical improvement in the treatment of flooding at the commencement of labour. He divided hæmorrhages before the birth of the child, into two species—the first of which he called *unavoidable*, and the second *accidental.*

By the first kind—unavoidable—we understand cases in which the placenta offers itself at the os uteri, either blocking up the mouth of the organ (Plate 77), or being partially implanted over it (Plate 78); so that dilatation cannot take place without *necessarily* separating the placenta more or less from its uterine attachment, and without rendering patulous those orifices which were previously covered and closed by the apposition of the mass.

By accidental hæmorrhage, we mean those cases where the placenta—being attached, not over the os uteri or near it, but in its more natural situation, the fundus or body—becomes, to a greater or less extent, disunited from the uterine surface; but where the separation is perfectly *accidental,* and where it is not necessary that bleeding should occur upon the opening of the os uteri.

PLACENTAL PRESENTATION.—It has for a long time been known that the placenta is sometimes found at the os uteri under labour; and this malposition was noticed by Guillemeau,[†] Mauriceau,[‡] Amand,[§] Astruc,[||] Dionis,[¶] in France; Daventer[**] in Holland; Bracken[††] and Pugh[‡‡] in this country, besides others; but they all held the opinion, that it was not originally apposed to this part of the uterus by nature, but that, in consequence of some peculiar accidental circumstances, it had become loosened from its attachment above, had fallen down by its own weight, and had thus accidentally placed itself over the uterine orifice. But, inasmuch as not only is the placenta attached to the surface of the uterus, but the chorion is in apposition to that surface throughout the principal extent of the membrane—the decidua,

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[*] Treatise on Uterine Hæmorrhage, 1789, 4th edition.

[†] Œuvres Complètes, &c., fol. edit. p. 319.

[‡] Traité des Maladies de [illegible] 2, chap. 27.

[§] Pratique des Accouch. Obs. 20.

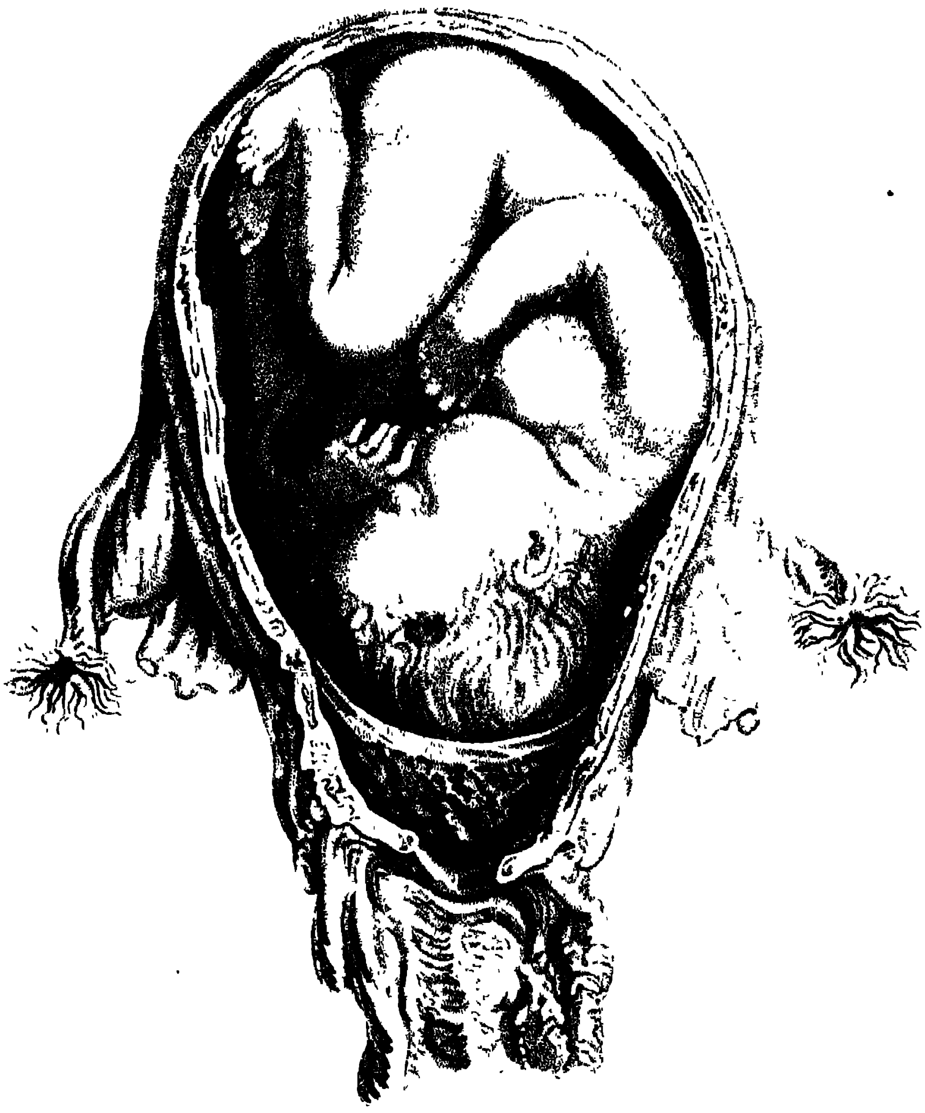
[||] Art. of Mid. 1767, p. 135, trans.

[¶] Treat. on Mid. trans. ch. 24.

[**] Art of Mid. trans. 1728, p. 153.

[††] Treat. on Mid. 1751, p. 132.

[‡‡] Treat. on Mid. 1754, p. 112.



indeed, being interposed—and inasmuch as the membranes are closely united with the placenta, it would follow (provided this idea was correct), either that they must be torn from the placenta all around, or that the whole ovum must partially revolve. We know that neither of these occurrences takes place; and that there is exactly the same arrangement of the vessels of the cervix uteri, and exactly the same kind of connexion between those vessels and the placenta, as obtains between that organ and the vessels of the other parts of the uterus, when it is placed in a more natural and fortunate position.

Portal[*] is the first author, as far as I can discover, who distinctly described the placenta, as implanted by nature over the os uteri. He gives nine cases, the first of which occurred in 1664; one of them appears to have been a partial presentation. He was evidently aware that the placenta was originally attached in that situation, and had not gravitated either by its own weight, or been detached by the movement of the child, and thus fallen down into the position where it was discovered. Although the cases he related, so forcibly conveyed his sentiments, they did not attract the attention they deserved; and notwithstanding that Giffard,[†] Roederer,[‡] and Levret,[§] all entertained the same opinion, it was not till Smellie's[‖] most practical and valuable work became well known, that the truth was generally received by the profession. Even after this work was published, little consideration seems to have been paid to the subject, until Rigby[*] gave his excellent treatise to the world. Since that time, in consequence of the distinct rules he has laid down for our guidance, hæmorrhages before delivery have been treated on a certain and established principle.

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[*] Complete Midwife's Practice, trans. 1743, p. 29. His first edition appeared in 1685.

[†] Cases by Hody, 1734, pp. 278, 280, 513. Giffard seems not to have been acquainted with Portal's writings, and to have arrived at a correct knowledge of this position of the placenta by practice and personal observation; for in 1729 (case 84), giving the history of a case of hæmorrhage before delivery, he says, "No part of the placenta had as yet *sunk down* [to the mouth of the womb], as is customary upon flooding:" while in 1730 (case 115) he makes the following observation:—"I cannot implicitly accord to the opinion of most writers, which is, that the placenta always adheres to the fundus uteri; for, in this as well as many former instances, I have good reason to believe that it sometimes adheres to, or near, the os internum, and that the opening of it occasions a separation, and, consequently, a flooding." See for the same opinion his next case, 116. Heister (Institut. Chirurg. chap. 154, parag. 1) says some of the moderns consider as a cause of hæmorrhage, the adhesion of the placenta to the mouth of the womb; so that the more the os uteri is dilated, the greater is the separation of the placenta, and the more profuse the flooding.—This work was written in 1739. The first published case of the *dissection* of a woman in whom the placenta was implanted over the os uteri is given by Petit, in the Mémoires de l'Académie Royale des Sciences, 1723, p. 28.)

[‡] Roederer's work was first published at Göttingen, in 1753, two years after he was appointed, by our George II., to the chair of midwifery at that university. He there positively states his opinion that the placenta may be *attached* over the mouth of the womb. See the French edition, 1765, p. 365; or 317 of the Latin, 1753.

[§] L'Art des Accouch. 1761, p. 343, ed. ii.; and Accouchemens Laborieux, 1770, p. 51, ed. iv. Levret's opinions on placental presentations were first published in a paper by him, at Paris, nearly contemporaneously with Roederer's work at Göttingen.

[‖] Treatise on Mid. 1779, p. 143, and p. 120, note. The first edition was published 1752.

Under a placental presentation, then, there must necessarily be a greater or less discharge of blood, on the dilatation of the os uteri, which generally increases in proportion as the os uteri opens; and if the case were left entirely to nature, the bleeding would proceed either as a draining or in gushes, until the successive faintings terminated in a mortal syncope: or—the os uteri dilating rapidly, and the womb acting vigorously—the head of the child bearing forcibly against the placental mass, might expel it, first, and itself quickly follow: for it would be impossible for the child to perforate the placenta, and pass through it; and it would also be unlikely that it should escape by its side, provided the mass were implanted centrally over the uterine mouth. A number of cases are on record in which the placenta was expelled before the child in the manner I have just mentioned. Smellie has noted three,[†] La Motte three,[‡] Lee three;[§] my father[||] has given three which came under his own observation, and two others communicated to him by friends. Baudelocque,[¶] Perfect,[**] Merriman,[††] Barlow,[‡‡] and Collins,[§§] each mention a case. Hamilton had seen two,[||||] I have met with four, and others are scattered through the various periodicals. Although there is thus a possibility of a natural termination of the labour by the placenta passing first, and the child being expelled afterwards, it would be wrong to expect it, or to wait for it; for the probability is, that the woman will bleed to death before the os uteri acquires a diameter sufficient to allow the passage of the placenta and the child through it.

Knowing then, that in the great majority of instances the patient will die if relief be not afforded, it is considered as an obstetric principle, that, under entire placental presentations, delivery should be effected by art as early as is practicable without incurring the risk of injury. I shall proceed, therefore, to discuss the symptoms and the mode of treatment.

Symptoms.—There are some symptoms which are very suspicious of placental presentations, and others that assure us of the nature of the case. Those which are suspicious appear at the commencement of labour, and even before the accession of uterine action,—during the last weeks of pregnancy.

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[*] This was first printed in 1775.

[†] Collection 18, No. 3, Cases 5, 6, 7.

[‡] Traité des Accouchemens, 1765, Obs. 321, 322, 323.

[§] Medical Gazette, July 13th, 1839.

[||] Practical Observations, case 154, and two following. First edition.

[¶] Vol. ii. p. 37, translation.

[**] Case 109.

[††] Page 121.

[‡‡] Essays, p 273.

[§§] Practical Observations, pp. 91 and 103.

[||||] MS. Lectures, 1821; and Pract. Observ. p. 313.

We have already learned, that in the first months of utero-gestation, until, indeed, between the fifth and sixth, the cervix uteri is not developed; it has not yet been expanded, or taken up to form a portion of the general cavity; but when five months are perfected, or about that period, expansion commences, from above downwards, and this unfolding or developing of the fibres must necessarily produce a separation of the placenta from its previous attachment to the upper part of the cervix. This separation must in its turn occasion flooding, even before the process of labour is begun; because the orifices of the vessels previously in communication with, and plugged by, the placental mass are opened on its partial dislodgment by the gradual expansion of the uterine neck. We find, then, that during the last few weeks of pregnancy, a patient under placental presentation is liable to sudden gushes of blood, in a greater or less quantity, coming on without any apparent cause, —neither the consequence of exertion, nor accident, nor mental agitation; but when she is asleep in bed,—while she is sitting quiet in her chair,—when unemployed in any active duties,—she is unexpectedly seized with a flow of blood from the vagina. Her attention, perhaps, is scarcely drawn to the occurrence before it has subsided, or diminished to such a degree as to give her but little uneasiness: she will probably suppose that labour is coming on, and she may begin to make preparations for its approach. After the lapse of a few days, another gush takes place as unaccountably, and subsides as suddenly as the former; and attacks of the same kind recur at uncertain intervals during the remainder of her pregnancy. The constant return of hæmorrhage has a tendency to induce uterine contraction; and consequently we observe that under placental presentations, labour frequently comes on prematurely.* It is remarkable also that a comparatively very large proportion of these cases is complicated with preternatural and especially transverse presentations.†

Whether the patient's mind be impressed with much alarm or not at these repeated bleedings, to one acquainted with the physiology of the placenta, and the peculiar connexion between that organ and the uterus, such a history would be fraught with suspicion and anxiety; and she should be watched over with the most assiduous and solicitous attention.

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* Out of eighty-nine cases noted by Simpson, in which the period of pregnancy was specified, in forty-six labour came on prematurely. (Obst. Memoirs, vol. i. p. 698.)

† Out of ninety cases noted by Simpson, in which the presentation is mentioned, in thirty-one the child presented preternaturally; and in four of the head cases, an arm came down with it. (Id.)

Our suspicions may also be excited at the beginning of labour, if with every pain,—with every slight increase of dilatation in the os uteri—there be an increase of discharge, and if the flow of blood be moderated or suspended in the interval of action.

But we can only positively assure ourselves of the nature of the case by an examination per vaginam. To this the patient may be unwilling to submit; she may suppose we can be of no service to her, since the pains are so infrequent and trifling. It is our bounden duty to combat her objections, and to insist on the necessity of the measure proposed; since our practice so much depends on the information we gain. The examination will most advantageously be made with the two first fingers of the left hand, because they pass so much higher within the pelvic cavity, and so much more completely command the os uteri. By this inquiry we learn whether the placenta be implanted over the mouth of the womb or not; and if we discover its presence, we must ascertain whether the orifice be entirely or only partially occupied by the mass; for our practice differs much under the two varieties.

Diagnosis. — We shall know the placenta by the fleshy, fibrous, and lobular sensation which it communicates to the finger, and by its being attached to the inner surface of the cervix uteri.* If we can introduce our finger sufficiently far to pass it round within the orifice, we shall be sensible of this attachment, although the union is very easily separated. There is but little chance of our mistaking the placenta for the membranes partially protruded into the vagina, or for any part of the child's body; but there is a great probability that we may mistake a coagulum, blocking up the os uteri, for the placental mass apposed over it. How, then, shall we discriminate between these two? — The placenta cannot easily be perforated or broken down; the tenacity of a coagulum may without difficulty be destroyed. The placenta is attached within; a coagulum lies loose. The placenta cannot be removed by the finger; but we can generally bring away a coagulum. If there be any doubt, we should take these means — we should try whether it is attached, — whether we can break down its structure, and whether we can remove it from its position; but these attempts must be made with the greatest possible care. The detached surface of the placenta is in these cases very commonly covered by a smooth layer of firm coagulated blood, which being interposed between the finger and the substance of the mass, prevents our feeling the placenta itself; and deception is thus more likely to occur.* But a careful attempt to break down the coagulum, or remove it from its situation, will be, in most instances, sufficient to assure the inquirer of the true nature of the case.

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* Plate 77, copied from Hunter, shows the placenta implanted over the uterine mouth.

MANAGEMENT OF PLACENTAL PRESENTATION.—Since, when the placenta is situated over the mouth of the womb, attacks of hæmorrhage generally recur at uncertain intervals during the last few weeks of pregnancy, so it is more than probable that our attendance may be desired on two or three occasions previously to the accession of labour; the patient being suddenly seized with a gush of blood, while in bed, perhaps, or otherwise quiet. She will very likely suppose at first that the membranes have broken, and expect labour to follow rapidly; but on examining her linen, she becomes sensible that the discharge is blood, and in a greater or less alarm, she summons her medical attendant to her assistance. On his arrival, he will probably find that the flow has ceased, and that she is more composed, though perhaps a little faint, and agitated.

Our first endeavour, under such circumstances, should be to calm her mental anxiety; and the next, to prevent a return of the bleeding. Should the flow have ceased, and especially if it have not been profuse, we may with truth and propriety assure her that there is no present danger, and that the prevention of a recurrence will much depend on her own conduct; and we must proceed to lay down, in the strictest manner, rules for her future guidance. As a general principle, bleeding, and the exhibition of digitalis or other depressing agents, are in such a case inadmissible; perfectly so, indeed, unless she be plethoric,—unless the arterial system be acting with undue energy, or unless fever be present, or indications of local determination to some particular organ.

Nor will it be generally necessary to make a vaginal examination, unless, indeed, the pains of parturition have already shown themselves; for if the term of pregnancy be distant five or six weeks,—the os uteri being closely shut,—by such an inquiry we should gain no information; we might, moreover, disturb the coagula formed at the patulous vascular orifices; and thus we should run the risk of causing a renewal of the bleeding. However desirable, then, it might be positively to ascertain whether the placenta were situated over the os uteri or not,—since this knowledge is so difficult to acquire, and since the attempt would most likely augment the danger,—it is better that we should remain satisfied with suspicion, than that we should disturb the temporary safeguard Nature has established, especially as no means can be used except of a palliative nature, so long as the os uteri continues perfectly closed. But, on the other hand, if the flooding be still going on,—if the patient have arrived at the end of gestation, or near it, and particularly if the uterus be contracting at intervals, however weak the pains may be,—we should insist on making an examination per vaginam, and act according to the principles immediately to be laid down. I shall now presume that labour has not commenced, that the term of gestation is not fulfilled, and that the discharge has entirely or nearly subsided on our arrival.

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* See Ingleby on Uterine Hæmorrhage, p. 142.

Absolute and uninterrupted quietude in the horizontal posture, and on a hard bed, must be forcibly enjoined, and an anti-hæmorrhagic regimen prescribed; she must breathe a cold atmosphere; be but lightly covered; her diet must principally consist of nutritious fluids—cold and acid drinks may be given almost *ad libitum*, and ices may be allowed, unless they produce intestinal pain or shivering: everything stimulating, both alcoholic or of any other nature, must be strictly forbidden. The mineral acids, under such a case, may be usefully employed; some gentle aperient will be required, and the acidulated infusion of roses, with small doses of sulphate of magnesia, is perhaps the pleasantest, and, at the same time, as efficacious a medicine as any that can be exhibited. We must avoid a constipated state of bowels; because the straining necessary for the passage of hardened fæces may dislodge the coagula collected over the exposed vessels, and produce a return of the flooding. We must equally, also, avoid violent purging, lest the frequent evacuation of the rectum should occasion a like disaster. A cold enema may be administered daily, unless it produce catarrh; this will probably act beneficially in two ways,—both by clearing the rectum, and restraining the hæmorrhagic tendency.* Opium may be exhibited, if there be present much nervous irritability, an excited state of mind, or spasmodic and false pains; but as I have little faith in the power of opium to suppress hæmorrhage, I should not administer it with that specific intention; and I think I have obtained as much advantage from the pharmacopœial preparations of henbane or hemlock, in quieting an excited state of the nervous system under these circumstances, as from opium itself. Before our departure, we must direct that, on the occasion of another attack, cloths steeped in cold vinegar and water should be applied to the vulva and lower part of the abdomen; and that we should instantly be made acquainted with the occurrence. It is very possible that we may be called three or four times to the same patient under the same circumstances, and on each occasion may think right to repeat the same cautions and renew the same general directions.

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* I would inculcate a caution regarding the injection of cold fluids into the rectum. If persevered with, they are liable to induce catarrh and cough; of which I have known two or three instances. Should that be the case, they must prove prejudicial rather than useful; because the succussion of the person with each return of cough would be likely to occasion a fresh eruption of blood.

But a period will arrive when the features of the case will be changed; when uterine action will supervene; and when, as the mouth of the womb begins to dilate, the hæmorrhage will consequently be increased. It then becomes our duty carefully to consider when delivery shall be effected, impressed as we are with the conviction that it will be ultimately necessary; and that our patient will remain in imminent danger until it is accomplished.

In determining this question, it must be evident that before a certain degree of dilatation is effected, the hand cannot be introduced for this purpose; but it is also evident that if we wait for the os uteri being widely open, the probability is, that the patient will be so much exhausted as to leave little chance of her survival, even under the most skilful management. The two extremes, therefore, of forcing the hand through the mouth of the womb, while it will not admit of artificial dilatation without sustaining injury, and of delaying our means until the system is depressed beyond the hope of recovery, are both equally to be deprecated in practice: and it becomes a very nice point to fix the exact time when our assistance will be most serviceable.

We may lay it down as an axiom, that as soon as the os uteri is dilated to the diameter of half-a-crown, the hand may generally be introduced without injury, provided the term of gestation be fully, or nearly completed; and that it would be unwise to wait for its further development, because we may expect that, with the increase of every line's diameter, there will be an increase of the bleeding, and that such a fearful loss will be sustained as will eventually terminate in death. When this specified degree of dilatation is acquired, we are warranted in undertaking delivery; and it is to be accomplished in the following manner:—The patient, lying on her left side, is to be brought conveniently near the edge of the bed, and gently restrained by the means I have before mentioned when speaking of transverse presentations. The operator having taken off his coat, and kneeling by the bed-side,—the left hand and arm being greased,—the fingers are to be collected into the form of a cone, slowly insinuated through the external parts, and carried up to the brim of the pelvis, in the direction of the axis of the vagina; the os uteri must be carefully dilated, with a slow semi-rotatory motion, and the hand passed fully into the uterine cavity,—by the side of the placenta,—partially separating that organ from its attachment to the uterine neck. It must be introduced either anteriorly, posteriorly, or laterally, in whichever direction the placenta appears to be thinnest, because the edge of the organ will then most probably be soonest reached, and the uterine vessels will there be found smallest. It is not, however, always easy to distinguish the point at which the placental edge may be arrived at most readily. That part of the cervix uteri, over which the placenta is implanted, indeed, gives to the finger a *doughy* feel, which is very characteristic; and the thicker the portion of placenta is, the more perfect will this sensation be. If therefore one side of the os uteri feels more doughy than the other, the separation should not be continued in that direction. But this can only be learned by some experience in the matter; and consequently in this part of the operation, we must trust somewhat to accident. Having gained the membranes, they must be punctured, the hand carried into the centre of the ovum, run along the person of the child until the feet be felt; and one or both of these limbs must be brought down through the rent in the fœtal membranes. The child's body is thus made to revolve on its own axis,—provided the head presents or it lies transversely,—and the breech descends into the pelvis. To facilitate the expulsion, and to ensure ultimately as perfect a contraction of the uterus as possible, gentle pressure may be applied over the uterine tumour, through the parietes of the abdomen; and unless the hæmorrhage be continuing profusely, rapid extraction of the child's body should be most cautiously avoided. For the success of the operation it is not of much importance which hand is used; either may be selected, according as the operator has command over them. My reasons for preferring the left have already been given when treating of delivery under a transverse presentation. As we cannot know to which side of the uterus the child's abdomen may be turned, the recommendation of those practitioners who tell us we must use the left hand provided the face is looking towards the back part of the uterus, or the right side of the spine, and the right hand if it be in the opposite direction, is rendered nugatory.*

When about to perform the operation just described, it must be remembered by the practitioner that his patient's life will depend in a great measure on his own knowledge, presence of mind, and perseverance; and when once he has undertaken the dilatation of the os uteri, he must unflinchingly proceed to the termination of the delivery, unless some extraordinary difficulty should present itself. The hand, then, must be passed slowly and carefully onwards: for to withdraw it would be to risk a renewal or perilous increase of the bleeding.

It might be supposed that the extensive separation of the placenta from its uterine attachment, in the introduction of the hand, as just described, must in all cases produce a frightful augmentation of the hæmorrhage, and that there would be little chance of the patient's survival. This, however, fortunately, is not usually the case. On the first introduction of the fingers through the os uteri, there is certainly almost always a gush of blood, and perhaps to a copious extent; but when the hand has fully entered the orifice, by the pressure it exerts on the open vessels it acts as a plug, and prevents any great additional loss; as it is carried further, the arm performs the same office; and when the breech of the child is brought into the vagina, or to rest upon the pelvic brim, the body itself causes a like compression: so that, if the delivery be skilfully managed, the increase of bleeding which takes place under it is comparatively trifling.

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* See Meigs, p. 436.

Dreading the fresh accession of discharge which it was thought must necessarily attend the uncovering of so many vascular orifices, by the hand being slid between the neck of the womb and the placenta apposed over it, some practitioners have recommended that we should perforate the substance of the placenta itself, by working our fingers successively through it.* To me, indeed, this proceeding offers many objections; and the principal consists in the difficulty of its performance. It is by no means an easy matter to perforate the structure of the placenta by the fingers, when the organ is taken out of the body and lying on a table; how much more difficult must it be, then, to run the fingers through it, when it is attached over the os uteri, when there is no resistance behind to favour our attempt! How much more likely is it that the mass may be lifted entirely away from its connexion with the neck of the womb, and carried up before the hand! And if this should occur, it is reasonable to suppose that the discharge would be much more profuse than if a smaller portion were separated, and the hand passed along between it and the open vessels.

For although the hæmorrhage may perhaps generally cease, when the placenta is expelled *naturally* before the child,—the uterus acting powerfully, and rapidly constringing its vessels,—still, under such an *artificial* and *forced* detachment as we are now considering, I cannot but think that the discharge would be considerably aggravated, notwithstanding the averments made by Mr. Kinder Wood, and Drs. Radford and Simpson, to the contrary.*

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* According to Richter, this practice was first introduced by Deleurye and Mohrenheim (Praxis Medico-Obstetriciæ Mosquæ, 1810, 4to. p. 176). This is a mistake, as Deleurye (*Traité des Accouchemens*, p. 368) argues strongly against the practice; but he recommended the placenta to be pierced by an instrument in some cases, to let off the liquor amnii: hence the error. And Mohrenheim did not publish his "Abhandlung uber die Entbindungskund" till 1791, while Smellie (case 8, No. 2, collect. 33, A.D. 1750) states that, not being able to perforate the membranes, he pushed his fingers through the placenta. In case 14, related to him by a professional friend, the placenta was also perforated.

It certainly happens occasionally that the placenta is so soft as scarcely to bear being lifted by its edge without falling to pieces; and under such a morbid state the fingers might easily be passed through it: but this is unusual, and our practice must be regulated, not by the exceptions, but the ordinary condition. Besides, the aperture made in the placenta by the hand not being larger than the hand itself, sufficient space is not gained to admit the easy passage of the child's body, arms, and head, which must become entangled in the placenta, and would probably lacerate the mass as they are being extracted; in such case, not only must the pressure on the funis be great, but there would be danger of the placenta being entirely pulled away from its connexion with the uterus, as the arms were being extracted.

Again, so long as we preserve the placenta entire, we prevent any loss of blood from the fœtal system; but when that organ is torn, the vessels must necessarily be ruptured, and the child, if it be alive, will most probably bleed to death. It is almost incredible how small a loss of blood is sufficient to destroy a newly born infant. A few drachms oozing from the funis, if the ligature be loosely tied, has been known to cause a fatal result. By perforating the placenta, then, we run a great risk of destroying the fœtus. It may be argued, that the life of the child is not to be brought into competition with the safety of the mother; nor indeed should it; but as I believe there is equal, if not more danger incurred to the mother by such a proceeding, I would endeavour by all means to preserve the child, provided that were possible. It may be said, moreover, that in many cases of placental presentation,—if not in the majority,—the child is born still; and that therefore the chance of its ultimate survival is but small. This I am willing to grant also; but if the fœtal vessels be preserved entire, its death is caused, not by any loss of blood from its own system, but in consequence of its being deprived of the benefits which result from the uterine circulation. During the faint under which the mother lies, the blood is neither sent in the same quantity, nor with the same velocity, to the uterus; consequently, the changes necessary for the continuance of fœtal life cannot go on in the placenta: the child ceases to exist in consequence of the want of those changes; it dies from asphyxia,—as perfectly suffocated as if it were drowned after the commencement of respiration.†

But the favourable time for the performance of the operation which I have just noticed may have slipped by before we have an opportunity of seeing the patient; and we may perhaps find her faint, and gasping, and cold; the uterus quite inactive, with its mouth widely open, and possessing that degree of unresisting flabbiness which, to an experienced hand, is indicative of the most urgent danger. Under this condition delivery would indeed be easy, but it would at the same time be followed by almost certain death; for if we empty the uterus under syncope, or deep and long-continued faintness, we cannot reasonably suppose it will take upon itself that degree of active contraction necessary to close its vessels, and ensure permanent safety. It would, then, be most injudicious to proceed at once to the operation. Our indication should rather be, to rouse the patient from the torpid state in which she is lying—to bring her system up to a certain point, before we attempt to evacuate the womb. Stimulants here, then, are absolutely called for. Brandy, ether, ammonia, and other cordials, may be exhibited; and transfusion of blood might even be performed, with the view of inducing the temporary restoration so necessary to be procured before delivery is attempted. To the employment of opium under such circumstances I have objections on the grounds stated before, although sanctioned by high authority. I cannot agree with Professor Burns * and Dr. Stewart, † that this drug will check the flow of blood; and I think we possess other cordials and stimulants quite as efficacious in rousing for a time the depressed vital powers, by the exhibition of which we do not incur the danger of eventually paralysing the uterine energies. In most cases we shall find the ergot a serviceable remedy after the stimuli have taken effect, and before the operation is proceeded in. A dose or two of this medicine, indeed, may be given in every instance of placental presentation, previously to the delivery being undertaken, if time admit of its exhibition.

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* See page 417.

† I would refer the reader to Baudelocque, parag. 985, Dewees, parag. 1152, and Davis, Obst. Med. p. 1045, for arguments against perforating the placenta in this case.

Under the circumstances now treated of, especially must we bear in mind, that although it is a maxim in obstetric practice never to allow a woman to die undelivered, if delivery can by any means be accomplished, still it should also be another maxim, never to empty the uterus during the continuance of an attack of syncope; for it is not the mere extraction of the child to which our attention should be directed, but leaving the patient in the most favourable condition, with respect to ultimate recovery, that the nature of the case will admit of.

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* Fifth edition, p. 304.

† On Uterine Hæmorrhage, p. 49: he recommends four grains of solid opium, or one hundred drops of laudanum, to be administered before proceeding to delivery; that the dose should be repeated as often as symptoms of irritation occur; and increased according to the urgency of those symptoms.

Again, it is by no means impossible that such alarming symptoms may show themselves before the os uteri has acquired the diameter of half-a-crown, as to render it extremely hazardous for us to delay our means until that degree of dilatation is arrived at. The blood may be gushing forth in a copious and continued stream, or may be oozing away in a less violent though steady draining; or coagula of considerable size may be passing from the vagina every few minutes: and it must be evident to the least attentive observer that such a state of things cannot be allowed to proceed unchecked. Two modes offer themselves for our choice: either immediate delivery, or endeavouring to restrain the flow, and delaying until the due degree of dilatation is effected. Our practice will mainly be guided by the state of the os uteri itself: if it appear soft, lax, and distensible, offering but little resistance to our fingers in the attempt at dilatation, we shall mostly be able, under the use of sufficient caution, to pass the hand entirely through it without injury, even although its disc at the time of our commencing the operation, did not exceed the diameter of a shilling; and, indeed, I have succeeded in turning on some few occasions, under these unpromising circumstances, by slowly insinuating the fingers *seriatim*. Although, then, such a proceeding is not desirable, if it can be avoided,—inasmuch as every minute's delay brings with it an augmentation of danger,—we are fully justified in effecting the dilatation of the os uteri thus artificially, even when, at the beginning of our efforts, it will scarcely admit the introduction of the tips of two fingers. For, as a principle, we shall find that delivery had better be had recourse to an hour too soon than an hour too late; and that the frequent fatality of these frightful cases is to be attributed, in a great measure, to the operation having been delayed until the system was irrevocably depressed.* The *dilatability* of the organ, then, is to be regarded as an indication of its capability of being fully opened,—as much as, or even more than, its existing state of actual *dilatation.*[*]

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* In most of the fatal cases of placental presentation that I have seen, the result was attributable to the delivery not being performed early enough; the attendant *waiting for pains*. This is very injudicious. The uterus seldom acts strongly under placental presentation, either owing to the faintness the woman suffers, or some other not easily recognised cause. I have found that although there may have been no pain sufficient to make the woman utter a complaint, and although the os uteri may not have been dilated to the size of a crown, when the operation was undertaken, yet after the child is extracted, the uterus has contracted perfectly and firmly. This organ, indeed, seems to me to possess two distinct powers of contraction within itself;—one the active expulsive efforts,—the other a kind of elasticity, which disposes the fundus and upper part to follow, as it were, the body of the child in its descent, and thus to assist in closing its cavity. The late Dr. John Sims, who was an observant and very practical man, having been for the greater part of his life physician to the Royal Maternity Charity, seems to have held the same notions regarding the elasticity of the uterus; for in the London Med. and Phys. Journal, vol. vii. p. 484 (1802), he speaks of "the natural elasticity of the uterus," and makes a distinction between that action, and the "expulsive efforts, or labour-pains."

But the hæmorrhage may be profuse, and may perhaps threaten immediate dissolution, while the os uteri is dilated to no greater extent than the size of a sixpence or a shilling, and while it remains in a rigid, unyielding condition; and this is particularly observable when labour has commenced previously to the full term of gestation being completed.[†] It is seldom, certainly, that flooding proceeds to the extent of endangering life, without also causing a relaxed state of the uterine mouth. But occasionally, the complication of dangers just adverted to will exist together. Any forcible attempt at opening it artificially would, under such a state, be assuredly productive of injury, probably of a very serious character. As delivery, then, could not be accomplished, except under extreme hazard, no alternative is left us but to endeavour to suspend the flow, and to wait until the mouth of the womb has assumed a condition more favourable for the operation. The common principles must here be most assiduously followed; perfect quiet, in the recumbent posture, the application of cold and astringents, the removal of every cause of excitement, and the exhibition of cold and acidulated drinks. Local means may also in some degree avail us: the vagina may with advantage be plugged with a silk or cambric handkerchief, or lint steeped in oil, vinegar, or a weak solution of alum,—a practice strongly advocated by Leroux,[‡]—inadmissible, however, in any other case of bleeding from the uterus, after four or five months of gestation are completed. Some practitioners,* indeed, of great eminence, object to the employment of this means in any case of labour near the close of pregnancy, fearing an internal accumulation of blood, favoured by the distensibility of the uterine parietes; for, as I have before demonstrated, the uterus at full time is never perfectly filled by the ovum, but is capable of containing a considerable quantity of more matter. Thus, then, although the fluid be prevented draining through the vagina, much may be collected within the cavity of the womb, even to the induction of a fatal termination. This reasoning is undoubtedly true, to its fullest extent, in *accidental* hæmorrhage before delivery, under retention of the placenta, and in floodings after the expulsion of that organ; nay, as the blood concretes in the uterine cavity, the viscus is more and more distended; its vessels become gradually more and more dilated; their orifices gape wider and wider, and consequently they are rendered capable of pouring out a larger quantity of blood in a given space of time. The application of the plug, under such circumstances, would be adding, in a geometrically increasing ratio, to the peril of the case. Nor must another cause of additional hazard be overlooked: the external flow of blood being prevented, the source of danger is concealed, and it is possible for fatal deception to arise. But when the placenta is implanted over the os uteri, it is, in my opinion, unlikely that blood will be poured out into the womb itself; and if the vagina be perfectly filled with the *tampon*, there is no other cavity in which the vital fluid can collect; so that in these rare cases we may have recourse to it with advantage. Blood is certainly less likely to accumulate at the cervix uteri than towards the upper part of the organ: and such a collection near the orifice as to endanger life can only, in my judgment, occur under a state of great laxity of uterine fibre, and extreme depression of the vital energies.

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[*] In confirmation, see Lee's cases of placental presentation, Clinical Midwifery, 1842, p. 142 *et seq.*

[†] It has scarcely ever occurred to me to have much difficulty in dilating the os uteri under a placental presentation, unless the labour was premature; and I have then always attributed the resistance I met with to the undeveloped state of the *cervix*, rather than to any rigidity existing in the fibres of the *os uteri* itself. Other practitioners seem to hold the same opinion, Smellie gives three cases in which the patients died undelivered, from flooding in consequence of the placenta being implanted over the *os uteri*, and in which he extracted the child from the uterine cavity by incision, or, as he calls it, by the Cæsarean section. One of these women was turned forty; it was her first pregnancy, and she was advanced to about the middle of the eighth month. Having separated the placenta from its attachment, after the child was removed, he attempted to dilate the os uteri with his hand from within the uterus. This he accomplished on the application of great force, but not without tearing it on one side, to the extent of two inches. He adds, "by this it appears how difficult it is to dilate this part in women going of a first child, especially when they are pretty old. Indeed it is sometimes impossible to be done *before they come to their full time*, and even then, not until the parts are thin, soft, and largely opened by previous labours." (Vol. iii. Collect. xxxix. No. 1, case 2.) Again, in his first vol. p. 289, 1779, when speaking of delivery under placental presentation, he says, "The younger the woman is with child, the greater the difficulty in opening the *os uteri*; and more so in the first child, especially if she is past the age of thirty-five." These facts should be borne in mind, because it is so common an occurrence for a patient, the subject of placental presentation, to go into labour prematurely, that this additional source of embarrassment and danger is by no means unfrequently met with in practice.

[‡] Sur les Pertes de Sang, p. 238 *et seq.*

Another objection which has been raised to the use of the plug under this emergency, consists in the necessity of removing it whenever we require to institute a vaginal examination, for the purpose of watching the dilating process going on in the os uteri: but the frequency of return, and the strength of the uterine contractions, will in some measure indicate to us the changes taking place in that organ; and we must be guided by those indications in regard to the removal of the plug, provided it stanches the flow outwardly, and provided also there are no evidences that internal hæmorrhage is going on. Although, then, I consider the *tampon* may be occasionally useful, I am far from recommending it in preference to other means: and I think it should only be resorted to in the rigid, unyielding condition of the os uteri just mentioned, when the discharge is alarming, and can be restrained in no other way, and when an attempt at delivery would endanger its integrity.*

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* Merriman (Synopsis, p. 127) says he thinks the plug inapplicable in all cases when the bulk of the uterus exceeds that of a pregnancy of three or four months, or when the parietes are so easy of distension as to yield readily to the accumulation within. Gardien (Traité des Accouchemens, tom. ii. p. 419) objects to the plug in placental presentations, because it excites the uterus to dilate its orifice, and thus increases the hæmorrhage. Stewart, p. 49, makes the same objection, for the same reason. Hamilton also (Prac. Obs. p. 331) condemns it; while Davis (Obst. Med. p. 1048), Burns (fifth edit. p. 302), and Dewees (parag. 1093, &c), speak in favour of the means. Astringent injections in these more formidable cases of hæmorrhage are of no benefit and they may be injurious, by washing away coagula.

All the best authorities agree in stating that much hazard attends on any *forcible* efforts at dilatation, when the os uteri is rigid, since laceration of that organ might be the consequence. This lamentable accident, of which many instances are on record, is the more likely to occur when the placenta presents, and undue rigidity exists, because the structure of the part must be weakened by its high degree of vascularity, and the enormous size which the veins in connexion with the placenta have acquired. To this also may be added that, if torn, the accident is more likely to be followed by a fatal result, than in the more ordinary cases, because the hæmorrhage from the broken vessels will probably be excessive, owing to the magnitude they have acquired.

I have given the student to understand that placental presentations are always fraught with extreme peril; I look upon them, indeed, as the most dangerous of all cases of hæmorrhage; and many causes contribute their share towards the production of this danger. The frequent losses of blood which occur previously to the accession of labour, tend, in no small degree, to depress the constitution, and render it unable to sustain the aggravated shock, occasioned by the repetition of the discharge on the opening of the os uteri. The violent gushes which generally accompany the dilatation of the womb, and the natural and praiseworthy reluctance which most practitioners feel to a *forced* delivery, when the os uteri is in an undilated state, even although it be soft and yielding (and this very feeling may induce delay beyond the period of safety—of which I have myself known many lamentable instances), all combine to render this, indeed, a fearful case. But it appears to me that still another must be added: I mean, the sudden emptying of the uterus of the *whole* of its contents nearly together; and that, too, at a time when the constitution, weakened by hæmorrhage, is easily affected by any depressing action. We well know the effect of suddenly evacuating the water in ascites; we know that the most courageous and hardiest persons will sometimes fall into a state of syncope, even under the comparatively trifling operation of tapping; and we account for the faintness by the rapid removal of that pressure from the large vessels of the trunk—and perhaps from the viscera themselves—to which they had been for so long accustomed. It appears to me that the same circumstances obtain in delivery under placental presentation, as commonly practised. The gravid uterus occupies a very large space in the abdominal cavity; during its gradual increase, it has been exerting a constantly augmenting pressure on all the parts surrounding it;—these parts accommodating themselves to the inconvenience they must necessarily suffer during pregnancy, by the slowness of the organ's development. But when its contents are suddenly removed—when the liquor amnii is allowed to escape, and with it the fœtus is extracted also—an enormous decrease in its bulk is occasioned—considerable pressure is at once taken off,—and that, too, at a time when the system is suffering much from previous depressing causes—and we cannot wonder that collapse occurs as a consequence, even should the delivery have been perfected with but slight additional loss of blood. It has occurred, therefore, to my father* (and in his sentiments I fully join), that in some aggravated cases it might be desirable partially to evacuate the uterus, and wait for a short period, before completing the delivery, provided this could be done without inducing a further separation of the placenta; and the discharge of the liquor amnii seems to offer us a means of accomplishing this end. For this purpose, however, the placenta must be perforated by some sharp instrument — a common trocar for instance; and a probability therefore exists, that fœtal blood may be lost by the laceration of one or more placental vessels. Such a chance of injury we cannot guard against; and as this mode of proceeding would only be advisable when the woman is very much depressed, and when, as a consequence, the child would have almost invariably perished, the chance of its being born alive ought scarcely to influence our practice. I have myself resorted to this expedient on some few occasions, on the principle of emptying the uterus as slowly as possible, by which both the pressure is removed more gradually, and also a better opportunity is afforded the viscus of taking on itself expulsive action.

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* Many cases have come under my notice, where plugging the vagina under placental presentations has restrained the flow of blood for a time. And should the attendant be diffident of his own capabilities, and anxious to obtain the counsel of a friend, he may, with great propriety, have recourse to this measure in the interval that must elapse before assistance can arrive. But I would strongly advise every well-educated surgeon, if the bleeding be profuse and the os uteri lax and dilatable, rather to undertake the delivery himself, and alone, than send to any great distance for aid; because every hour's, not to say minute's, delay, under such circumstances, increases the hazard of his patient; and because the delivery in itself is not very difficult.

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* Practical Observations, part ii. p. 189, first edition; p. 301 of the second. I find my father was far from being the first to put forward this idea; though I have no doubt it was an original thought of his own, as far as he was concerned. For before the dawn of the last century Daventer recommended the placenta, when presenting, to be perforated; adding, "Some penetrate the placenta or secundines with a hair needle, which I do not approve of (if it can be done by the fingers), because the infant is easily hurt." (The Art of Mid. Improved, third edit. London, 1728, pp. 153, 154.) In the original his words are: "Placentam vel secundinam *acu crinali* perfodiunt." (See his *Novum Lumen*, &c. Leyden, 1733, edit. 2nd, p. 138. This book was first published in 1696.) Deleurye recommends the placenta to be pierced by a trocar, to allow the water to escape (Traité des Accouchemens, Paris, 1777, p. 369); and Baudelocque (parag. 983, trans.) considers, if the placenta were to be perforated at all, a trocar would be preferable to the fingers. Gendrin has of late successfully adopted the practice in Paris. (Traité Philosoph. de Médecine Pratique, tom. ii. p. 548.)

It is more than probable that spirituous stimuli may be required during the process of extraction, as well as after the completion of the birth. Since, however, their exhibition is such a nice point, it must be regulated by the *extremest caution*.

On the 24th of December, 1844, Dr. Simpson submitted to the Medico-Chirurgical Society of Edinburgh, a memoir, in which he advocated the practice of removing the placenta before the delivery of the child, in cases where that mass presented itself at the os uteri, provided the evacuation of the liquor amnii did not arrest the hæmorrhage, or where delivery by *turning* would be dangerous, or otherwise inapplicable.*

The withdrawal of the placenta before the child, indeed, where it was largely separated, or lay loose in the vagina, had been practised, during the seventeenth and eighteenth centuries, by Guillemeau,† Mauriceau,‡ Daventer,§ Pugh,‖ and a great many other obstetricians. But they all had recourse to this expedient as a matter of necessity,—not of choice,—that they might free the maternal passages from the presence of a body which would be likely to embarrass them in the subsequent operation of *turning*.

Believing that the placenta had slipped down over the os uteri from its original position, high up at the fundus, they looked upon it, when they found it in this unusual situation, as a foreign body, and considered that it was so completely separated from the uterine surface, that its removal did not entail any increase of its detachment.

Dr. Simpson, on the contrary, advises that it should be taken away as a matter of choice; ¶ and thinks ** that "when our practical acquaintance with this method of treatment becomes more extensive, and the measures for effecting it are simplified, and better understood, it is possible that the practice may come to be applied" in almost all cases which are now treated either by letting off the liquor amnii, or by turning the child *in utero*.

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* See the Monthly Journal of Med. Science, March, 1844, p. 169, or Obst. Memoirs, p. 677.

† Les Œuvres de Chirurgie, Rouen, 1649, p. 320.

‡ Maladies des Femmes Grosses, tom. i. p. 333.

§ Art of Midwifery, 1728, transl. p. 153.

‖ Treatise on Mid. 1754, p. 113.

¶ "The preceding extracts show that the cases and circumstances under which the removal of the placenta before the child has been recommended by some of the

** Obst. Memoirs, p. 780.

He founds this recommendation on his notions respecting the utero-placental communication: for he follows the late Professor Hamilton, of Edinburgh,* in the belief that in uterine hæmorrhage, during labour, the blood passes directly, not from *the open uterine vessels*, but from the *separated portion of the placenta*. He thinks that the "vascular maternal cells, or immensely dilated capillaries, which contain the blood of the mother in the placenta, communicate so freely with each other throughout all the different portions of the organ, that the blood which has access into one part may, in this way, be rapidly diffused into the other portions of the placental mass;"† that the blood, indeed, being poured

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older authorities, are entirely different from those in which I wish in these pages to insist upon its propriety. I advise its separation in cases in which it is still attached to the cervix, and often still contained within the undilated os uteri; they advised its removal only in cases in which it is already separated from the cervix, and expelled through the dilated os uteri. They began their practice of removing the placenta at the very point in which I would generally end all my interference with it: viz., after the placental mass was completely detached. I would employ its artificial detachment as a measure of election and choice; they resorted to its removal from the passages, after it was detached by nature, merely as a measure of self-evident necessity and compulsion. I recommend its separation on the *pathological* principle of arresting the existing hæmorrhage, and so far cancelling the existing source of danger to the mother; they recommend its abstraction on the *physical* principle of clearing the obstructed maternal passages, and gaining more free space for the operation of turning. They removed the placenta in order to be able to have recourse immediately to turning. I would remove it in order to prevent the necessity of having recourse at all to that operation."—(Obstetric Memoirs, vol. i. p. 757.)

The late Mr. Kinder Wood, of Manchester, it seems, had in some instances removed the placenta before the child, as a matter of election, where it had originally presented; but this practice was only recommended by him "when there was so much exhaustion as to make us fear the effect of further hæmorrhage during artificial delivery." He says, "By this the hæmorrhage will be completely suppressed." And again, "I know by experience, that when the placenta is wholly detached, the hæmorrhage will cease." The same doctrine is held by Dr. Radford (Provincial Med. and Surg. Journ., February 26th, 1845, p. 133). Mr. Chapman (Duncan's Annals of Medicine, vol. iv. p. 308, 1800) of Ampthill in Bedfordshire, more than fifty years ago, in detailing a case where the placenta was expelled four hours before the child, and where the loss of blood was trifling, appends the following remarks, quite in point, "How far does this suggest a different practice to that generally followed? I mean that of delivering the placenta previous to delivering the child, in those cases of alarming hæmorrhage where the placenta is situated at the side of, or over the os uteri."

My father (Pract. Observ. 2nd edit. p. 315. Part ii. p. 235 of the 1st), though he discountenances the practice of *removing* the placenta first, still has put on record his opinion, "that less danger attends an entire, but *natural* detachment of the placenta in these cases, than is consequent on a partial separation of that mass, and that the expulsion of the child may afterwards be safely entrusted to the natural powers, without further interference."

* Pract. Observ. 2nd edit. p. 312.

† Obs. Memoirs, p. 725. See also p. 728.

from the mother's system into that portion of the placenta still remaining attached to the uterus, finds its way, by means of the communication existing among all these cells on the maternal face of the placenta, towards those cells that have been severed from the uterine surface;—and that thus the bleeding takes place from the placenta, and not from the womb. He imagines, also, that when the placenta has entirely parted from its uterine connection, since no more blood passes into any of the maternal cells, so no blood can be furnished by them; and that in this manner, hæmorrhage, which might have been going on profusely during a partial separation of the organ, is stayed as soon as that separation is rendered perfect and entire.

The student is already made acquainted with the views which I entertain in regard to the utero-placental communication;* and from them he will learn that, as I do not acknowledge the maternal cells, spoken of, to be dilated uterine capillaries, so I cannot subscribe to the idea, that the bleeding proceeds from the placenta at all; and that chiefly for the following reasons. Nobody denies that it is maternal blood which is lost in uterine floodings; and nobody denies that, when the placenta is removed from its connection with the uterine surface, a number of vascular apertures in the venous trunks are rendered patulous;—now it is impossible to suppose but that hæmorrhage must result from so many and such large orifices being left unprotected, so long as the *vis a tergo* supplies blood for them to pour out; and since there are no valves in the uterine veins, the blood would not be prevented flowing, even if it were by regurgitation.

Again, Dr. Simpson affirms† that "the placenta must cease to yield any new or additional quantity of maternal blood, as soon as its own vascular connections with the mother are destroyed; or, in other words, the immediate source of supply of the hæmorrhage is cut off, and its continuance consequently prevented, as soon as the placenta is entirely separated from the interior of the uterus." If the hæmorrhage *must* cease entirely on the complete separation of the placenta, it would cease in *all* cases as soon as that separation is effected; but this is not so, as Simpson himself shows; for he gives five‡ cases in which the discharge continued to a very considerable extent, although the separation was perfected.

Further, if the *entire separation* of the placenta *from its uterine attachment* arrested hæmorrhage, flooding ought never to occur *post partum*, when the placenta *was expelled from the uterine cavity.* But every practical man knows, that one of the chief sources of anxiety attendant on cases of labour, is the liability to which all women, without exception, are exposed, of suffering a dangerous loss of blood, after the placenta is removed, at a time, indeed, when the process is commonly considered as terminated. Such losses, as we shall hereafter see, are not only not infrequent, but often very difficult to stop.

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* Page 71. † Obstetric Memoirs, p. 732. ‡ Op. cit., p. 703.

And lastly, I would ask, if the bleeding proceeded from the dilated uterine capillaries traversing the maternal face of the placenta, where does it come from in cases of early abortions, when the ovum is entirely surrounded by the shaggy, villous tomentum, before the placenta is elaborated, and consequently before the existence of these hypothetical dilated capillaries. It is by no means uncommon to meet with frightful hæmorrhage in abortions of six or seven weeks age. One of my own patients miscarried at about the end of the seventh week in two successive pregnancies; each time losing so much blood that the most alarming symptoms, even hæmorrhagic convulsions, supervened. On both occasions I scooped the ovum, which was partially protruding through the os uteri, out with my finger; and neither was larger than a small gooseberry. In such a case the blood must be furnished directly by the uterine vessels themselves.

In a case of Cæsarean section, performed last year, at which I was present, the placenta was found to be planted anteriorly, and the operator cut directly down upon it. On the separation of the mass from its uterine connection, the blood *appeared to well up* from it, and two of the gentlemen who observed it, thought that it flowed from the placenta itself. But I have no hesitation in saying that this appearance was quite delusive. The blood was projected from the uterine veins *against* the surface of the placenta in an immense mass, and washed over the maternal face, giving the appearance of its *having been afforded by* the placenta. When the *vessels in the parietes of the uterus* were divided by the knife, the blood spurted from them to a considerable distance, and if it had passed through any vessels in the placenta, it ought to have spurted from them in a similar manner. One of these divided veins was as large as my little finger, and the blood was projected from it in a stream to the extent of twelve or sixteen inches.

Dr. Simpson has with great pains collected the histories of one hundred and forty-one cases* in which the placenta was expelled before the child; eight of these, indeed, occurred under my own superintendence. In almost all this large number of instances the flooding either ceased entirely, or was very much moderated on the entire separation of the placenta.

It is curious that such an effect should follow. In many of the cases, however, the cessation of the discharge may be accounted for by the rapidity with which the process of labour was terminated. The os uteri opened quickly; and the uterus, acting powerfully, expelled the placenta first, and forcibly thrust the head down upon the open orifices. The apertures in the vessels that give passage to the blood were thus completely plugged, and a stop put to the hæmorrhage. The same strong contractions speedily expelled the child, and simultaneously, both closed the uterine cavity and sealed the uterine vessels.*

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* Obstetric Memoirs, vol. i. p. 690.

It is certainly true that in some cases,—when the shoulder was at the brim, for instance,—the presenting part was not of sufficient volume to act as a plug, in this way. Yet it must be borne in mind that, as the vessels permeate the uterus, throughout the whole extent of the parietes, in a very tortuous manner, any pressure that the uterine fibres might exert on the body of the child, after the evacuation of the liquor amnii, would have a tendency to compress these canals at some part,—probably a considerable portion,—of their windings, and thus prevent the blood passing through them onwards, towards their open apertures. Thus, although there were no direct plug applied to these apertures, nevertheless, bleeding would not occur, because of the compression exerted at a distance from them on the trunks of the canals themselves, or on their ramifications.

Since Dr. Simpson's Memoir was placed in the hands of the profession, a few more cases have been published in the different periodicals, in which the removal of the placenta before the child suspended hæmorrhage that had been previously going on. It would be a very satisfactory thing, if we could give a good rational and physiological reason for this occurrence so little to have been anticipated. Simpson, as we have already seen, supposes that the blood escapes from the maternal sinuses of the placenta; but he also offers another explanation, which appears to me to be nearer the truth. After stating that the capillaries in different parts of the body have the power of producing an increased determination of blood to themselves, and their corresponding arteries and veins, quite independently of any change in the great centre of the circulation, he argues that the dilated uterine capillaries are endowed with an *attractive* power, which keeps them full, so long as the placenta remains attached; but that when that organ is separated, the course of the utero-placental circulation is altered, and the blood is thrown upon other channels; because, the great physiological aim and object of that circulation being removed, there is no necessity for its being continued as heretofore; "hence," he remarks, "probably even the orifices of the congested and enlarged uterine veins opening on the interior of the uterus, and lying near the existing line of junction between the uterus and placenta, may occasionally allow of some discharge, in addition to the freer form of flooding that we have seen to take place from the more patulous apertures left on the exposed surface of the placenta itself."* If any discharge whatever takes place directly from the congested and enlarged uterine veins, as supposed in this paragraph, we cannot but imagine, from their size, that the loss sustained would be sufficiently accounted for, without resorting to the hypothetical aid of a series of vessels that are undistinguishable, and which, as far as I can judge, only exist in a vivid and fertile imagination. Whether these dilated uterine capillaries possess such an elective and discretionary power over the blood, as to attract it towards themselves from the vascular system of the uterus proper, and such a distributive power, as to regulate the circulation independently of the heart, in obedience to the *necessity* exacted from them (a power which we see hourly exercised by the small capillary vessels of the body, as in the phenomenon of blushing for example, or in the conjunctivæ under weeping), is a point on which some doubt may be permitted; but I can state as a fact which has come within my own observation, in some degree corroborative of the idea, that it is rare for flooding to take place under labour when the fœtus is putrid, and therefore when it has ceased for some time to require to draw upon the maternal resources.

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* "I think it may be satisfactorily explained how the woman's life is preserved. The head of the child is pushed down upon the os uteri, which suddenly gives way; under its quick relaxation the placenta is loosened from its previous attachment, and falls down before the head, which now comes into immediate contact with the bleeding vessels, and by mechanical compression closes their mouths; from this moment, therefore, the loss of blood is suspended, and the head is afterwards expelled by uterine action." (Ramsbotham's Pract. Observ. 2nd edit. p. 303. Part 2nd, p. 192 of the 1st edit.)

Whatever may be the immediate cause of the subsidence of the hæmorrhage, when the placenta is removed before the child, as this has now become an operation of election, it is right that we should consider the cases in which the practice might be put in force. If, then, the os uteri were widely dilated when the patient first came under our observation, and the placenta were wholly, or in great part, lying in the vagina, so that it could be removed, *without passing the hand into the uterine cavity*;—if with this the woman was so much depressed by the previous flooding, that we feared lest the collapse, necessarily consequent on the removal of the uterine contents, might terminate in a mortal syncope; and if a draining of blood was still going on,—having administered a dose of ergot with or without stimuli, we might imitate the older authorities, and take away the placenta at once; for by so acting we should give an opportunity to the uterine vessels to diminish their calibre, after the evacuation of the liquor amnii,—give an opportunity also to the head of the child to come down upon the *os* and *cervix uteri*, and thus plug the open apertures there existing,—and at the same time we should furnish the best, or rather the only, means of affording compression to the vessels in their course through the *uterine parietes*, and of moderating the flow of blood along them to that part of the organ from which the placenta had been detached.

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* Obstetric Memoirs, p. 733.

The subsequent practice must then depend on the peculiarities of the individual case itself. Should the bleeding be put a stop to, we might wait, for some time at least, and hope for a natural termination: but should it still continue, delivery must be undertaken, either by *turning*, or by the *forceps*, or even by the *craniotomy instruments*, provided the child could not be extracted by either of the other means.* Again, if the patient were not more than five or five and a half months advanced, we might perhaps be able to separate the placenta entirely by passing the finger round within the cervix. If, therefore, dangerous bleeding was going on, the detachment of the mass, under such circumstances, provided it could be accomplished, might be undertaken. If, on the contrary, she had arrived near the close of gestation, and the os uteri was so rigid as to refuse admission to the hand for the purpose of turning, it would be impossible to detach and bring away the placenta, as some recommend;† because that mass extends over too great a space within the cervix for us to separate it by means of the fingers alone; and in any efforts that we might make we should be only increasing the peril, by increasing the degree of separation. It appears to me that if the hand is completely admitted within the uterine cavity, the passing it onward to the child's feet and bringing them down would be both more easy and more safe than taking away the placenta, and leaving the child within the uterus after that mass was withdrawn, to be expelled by the natural powers. Under such a proceeding the child must necessarily be born dead; and although in this kind of case its life too frequently falls a sacrifice, whatever treatment is employed, still it is our duty to endeavour to preserve it also, provided our attempts do not greatly compromise the woman's safety. So that if the patient is not very much reduced, I should prefer artificial delivery by version to the practice of dislodging and withdrawing the placenta.

PARTIAL PLACENTAL PRESENTATION.—As there is no part of the internal surface of the uterus to which the placenta may not be occasionally attached, so we find it sometimes *partially* placed over the orifice at the beginning of labour;—one-third, half, or two-thirds of the disc of the os uteri being covered by the placenta, and the remainder occupied by the membranes.

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* See instructions for delivery, under the article "Puerperal Convulsions."

† Vide Murphy, Lect. on Mid. p. 354.

Under this state of things, there will exist the same liability to hæmorrhage during the development of the cervix uteri, as in the case just described;—the same symptoms, therefore, during the last months of pregnancy—the same sudden and occasional floodings, not to be accounted for by any apparent external cause—the same spontaneous cessation. On the accession of labour-pains, also, the symptoms will be equally similar: we shall observe the same increase of discharge on the return of each pain, and the same diminution or subsidence in the interval of action; but the probability is, that the hæmorrhage will not be so profuse, because we may calculate on the vessels that are opened being fewer in number and smaller in calibre.

Diagnosis.—Although so similar in character and symptoms to the case last spoken of, partial placental presentations are by no means so hazardous; and they admit of a somewhat modified treatment. They can only be discriminated by a careful vaginal examination. On introducing the finger for this purpose, the edge of the placenta may be clearly felt, and the membranes passing off from it; a portion of the fleshy mass, thin and moveable, can also be distinguished, closing a part of the uterine mouth; while the remainder of the orifice is occupied by the membranes, through which the presenting part of the child may, perhaps, be perceptibly discerned.

It is very possible, if the os uteri be much dilated, that a considerable portion of the placenta may be propelled downwards into the vagina, apparently hanging loose in that cavity, but still connected within to the cervix uteri above. The danger will generally be proportioned to the quantity of the organ implanted over the uterine mouth; and the profuseness of the discharge will be principally regulated by the degree of separation.

Treatment.—Previously to the dilatation of the os uteri, our general management must be precisely similar to that already advised; but when labour is established, it must be regulated by the state of the patient herself, and the urgency of the symptoms present. Should the loss be but trifling,—which, however, is not often the case,—the labour may perhaps be allowed to proceed uninterfered with; but should a continued discharge be going on, it will be most prudent to rupture the membranes, and allow the liquor amnii to drain away; and this may be done with advantage, whatever degree of dilatation the os uteri may have acquired, and whatever degree of depression the patient's system may have suffered; provided the head present, or the breech, or any part of the inferior extremities. Nor will this be found difficult to effect

—either the finger-nail, the stilette of a catheter, or a pointed quill, being quite sufficient for the purpose. If a small segment only of the os uteri be covered by the placental mass, letting off the liquor amnii offers the best opportunity of compressing the vessels previously opened by the descent of the head upon the pelvic brim, and of increasing the expulsive efforts of the uterus by the augmented stimulus propagated to its mouth. And if the placental attachment be more considerable, and the flooding consequently more copious, so that artificial delivery subsequently becomes necessary, the uterus is relieved of a part of its contents before the operation is commenced, and no small degree of the danger necessarily attendant upon the case thereby averted. Another desirable effect produced, is a diminution in the capacity of the uterine vessels, in consequence of the partial contraction of the parietes, so that, being lessened in calibre, they are not likely to bleed so violently; and a third, the probability of a further separation of the placenta to any great extent being much lessened; for, so long as the membranes are entire, it stands to reason that the placenta is likely to be detached in the same proportion as they are protruded downwards into the vagina; but when the bag is destroyed, and the head presses with some power against the mouth of the womb, the chance of an increased separation is materially diminished, and by the same action a plug is formed by the compression which the head occasions.*

Nevertheless, it must not be supposed that a natural termination, though so highly desirable, will invariably follow the proceeding I have recommended: the after conduct of the case, then, must depend on the continuance of the hæmorrhage, and the effect produced on the constitution. If the flooding be at once stayed, and the patient were not much depressed, our indication would evidently be to allow Nature an opportunity of perfecting the delivery unaided. Even if a slight oozing continued,—provided the uterus was acting with vigour,—the labour progressing, and the powers of life remained tolerably good,—it would be injudicious to interfere, because so much less danger attends a natural than an artificial birth. But should the constitution become gradually weakened, should the pulse flag, and faintness occur, we must resort to manual delivery; and we shall find the operation of turning usually the most applicable to the case.

From the acknowledged probability that delivery may in the end be requisite, an objection has been strongly urged against evacuating the liquor amnii, under the impression that, after the escape of the fluid, the uterus may so powerfully compress the fœtal body as to prevent the introduction of the hand for the accomplishment of the operation of turning. I have already laid it down as a principle, that under transverse presentations the passage of the hand and version of the fœtus is comparatively easy while the membranes are preserved whole, but that it becomes an operation of the utmost difficulty when the fœtal body is closely embraced by the uterine parietes. It has been supposed that the same difficulty would be met with under the circumstances I have just described. Such reasoning, however, is founded on false data, and is in itself, therefore, untenable; for should the uterus act with sufficient energy to oppose a serious obstacle to the introduction of the hand, its contraction will be vigorous enough to propel the head so forcibly against its mouth, as to check the discharge by its own pressure, and eventually to expel the child,—provided, indeed, the pelvis be of ordinary capacity, and the soft parts have acquired their usual distensibility. When the fœtus lies transversely, it cannot pass by the agency of nature alone, because of its unfavourable position; but if the vertex offers under a partial presentation of the placenta, such an impediment cannot exist.

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* Plate 78, fig. 1, shows the placenta partially attached over the uterine mouth, the membranes being still entire: fig. 2, the same case after the water has been evacuated. It will be seen that the head, by pressing the placenta, forms a plug, which is likely to prevent any further loss of blood; while, by stimulating the os uteri by the same pressure, it may, and probably will, occasion a more rapid dilatation of that organ. The ergot may be exhibited with advantage after the membranes are broken.

After having punctured the membranes, the patient still requires careful and constant watching; and we must be prepared to act with promptitude should circumstances require our further interference.*

ACCIDENTAL HÆMORRHAGE.—The second variety of hæmorrhage before delivery depends on a partial separation of the placenta from its attachment to the body or fundus of the uterus:

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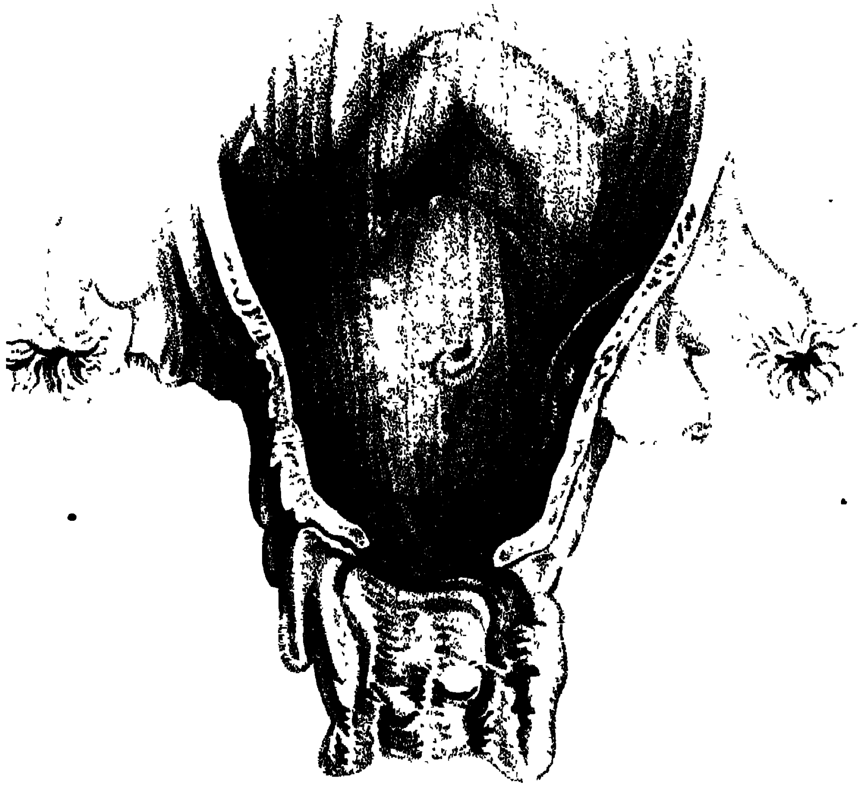
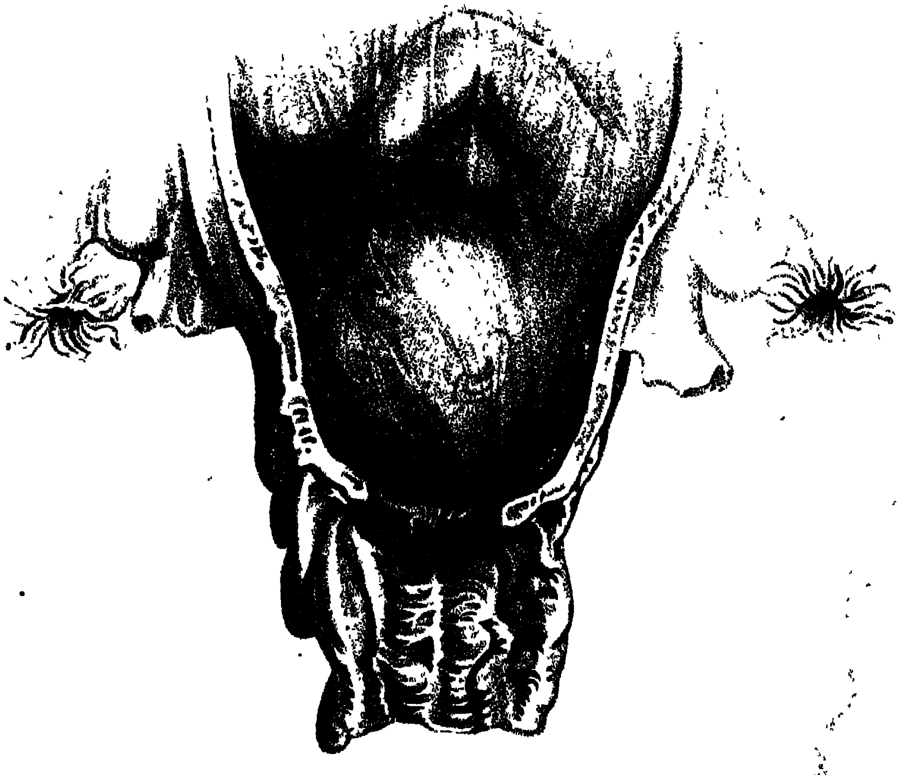
* Of partial presentation of the placenta, or its implantation on the neck of the womb, close to the os uteri, within reach of the finger under examination, it has fallen to my lot to see numerous cases. I have the detailed histories of one hundred and twenty-two, all of which I have personally attended. Of these one hundred and twenty-two, one was a twin case; in seventeen the fœtus offered itself at the os uteri with the breech or feet; and in ten transversely. In nearly half of these cases, indeed, the labour came on prematurely; but this statement corroborates the observation that I have made above, as to the frequency of preternatural presentations in cases of *placenta prævia*. In ninety-four, the membranes were ruptured some time before delivery; in forty-three the labour was terminated by the agency of the natural powers alone; in seventy-two the feet were brought down either by the operation of turning or by mere extraction, where they lay at the cervix uteri, the hæmorrhage not ceasing on the evacuation of the liquor amnii; in six the forceps were used; and one patient was delivered by craniotomy. Eighteen of these patients died; one of malignant puerperal fever, that was raging at the time; three of inflammatory or febrile attacks within three weeks; two in which the placenta was strongly adherent to the cervix uteri, giving much trouble in its separation; three in which the delivery was effected by the forceps, in consequence of a continuance of the bleeding after the membranes had been ruptured; and nine in which turning was performed under the same circumstances.





and as it is evident that, unless the mass be situated over or near to the os uteri, flooding need not *necessarily* accompany the dilatation of the orifice, so it is equally plain that the discharge in the case under consideration must be regarded as purely of an *accidental* nature.

It is probable that before the termination of gestation one or more attacks of hæmorrhage may appear; and that the first may be traced to a blow or a fall, sudden or unusual exertion, or violent mental agitation: but in general it does not show itself till the beginning of labour, and may, perhaps, be referred to undue and irregular action of the uterine fibres, at that particular part against which the organ is apposed. It is mostly observed in accidental hæmorrhage, that, after the establishment of labour, the discharge is diminished in quantity, or wholly suspended, while the uterus is contracting; and returns more copiously in the intervals of action.* In both these respects the suspicious symptoms differ materially from those of *placenta prævia;* for I have stated that, when that mass is implanted over the os uteri, as the uterine neck expands by a gradual growth—the fibres dilating circularly from above—its surface slips away from its connection with the placenta. I have shown that this separation is almost always attended by discharges of blood, at uncertain intervals, during the last few weeks of pregnancy, coming on without any assignable cause; that on the accession of labour also, with each contraction there is usually an increase of bleeding, and a diminution when the pain declines.

Although of a character to excite considerable anxiety, this case is very much inferior in danger to placental presentations, either partial or entire. The diagnosis from placental presentation is not difficult; it is known by the membranes being discernible, protruding more or less through the os uteri, while the presenting part of the child may be discovered through them; the placenta being completely out of the reach of the finger.

Treatment.—On this subject there still prevails a diversity of opinion among practical men, though the great majority strongly recommend the adoption of the plan I myself pursue,—an early rupture of the membranous cyst. This simple proceeding I have almost invariably found subdue the discharge, in the case under consideration, even more completely than in partial placental presentations; and, as far as my observation has gone, it has been attended with the happiest results.

Before the commencement of labour, indeed, the general treatment already recommended may be enjoined; and it will frequently be found that the discharge is arrested by a rigid adherence to the anti-hæmorrhagic system: but when the flooding continues while the os uteri is dilating, other means must be had recourse to beyond those of a mere palliative kind; and the evacuation of the liquor amnii, on the one hand, and immediate delivery on the other, have each, even in the present day, their advocates.*

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* This is easily explained by the pressure which the parietes of the gravid uterus exert on the ovum during contraction, and the temporary plug consequently created at the open orifices of the uterine vessels.

The great advantage resulting from letting off the waters of the ovum have already been noticed, when partial placenta-presentations were under discussion. The vessels of the uterus are diminished in size by the contraction of the uterine fibres;—the open orifices are in a degree plugged by the parietes being brought into closer and stronger contact with that portion of the placental mass disunited from the uterine surface; and the pains are usually increased in frequency and power by the augmented stimulus impressed upon the os uteri.*

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* Till within the last few years no part of obstetric practice was founded on more uncertain principles than the treatment of hæmorrhages before delivery,—some authorities advising the case to be left to the agency of Nature alone, others to puncture the membranes, and others again contending for immediate delivery in every instance,—but all agreeing that when the flooding is profuse, and the patient's life is placed in imminent hazard, emptying the uterus artificially offers the only chance of safety. And this discrepancy of opinion and advice evidently arose from the true nature of the different causes of the discharge not being well understood. Since the excellent treatise of Rigby, however, has become so generally known to the profession, not only is the obscurity in which those cases were shrouded removed, but, as I have before remarked, a fixed and determined principle of practice is established for our guidance.

Guillemeau, the celebrated pupil of the still more celebrated Paré, following the suggestions of his preceptor, advised delivery by the feet in all cases of dangerous flooding; and this method was almost universally adopted till the time of Julian Clement, who insisted on the more simple plan of rupturing the membranes: and to Puzos, the pupil of Clement, the credit is generally conceded of first publicly advocating this practice. But Mauriceau, whose work was written more than half a century before Puzos published, gives some cases where he ruptured the membranes with great success. The first in which he adopted this novel practice was on June 9th, 1688, and this is the earliest account we have of such a method being adopted to put a stop to hæmorrhage. The woman had a fall in the eighth month of her pregnancy, and flooding ensued. He gives as his reason for acting so, that she had not lost a large quantity of blood, and that the os uteri was opening: and he did it *lest the increased detachment of the membranes should augment the loss before the birth of the child.* He followed the same practice in his 50th case, as also in his 479th, where he plainly says the same principle should be acted on in all similar emergencies. See also cases 480, 496, 585, 624, and 633, for the same mode of proceeding. From his 52nd aphorism, we cannot but feel that he was quite aware of the beneficial effects of rupturing the membranes in flooding before delivery. Again, Daventer, who published at Leyden in 1696, gives clear instructions to perforate the membranes, by the side of the placenta when it presents, or the placenta itself, as mentioned above, if the other practice cannot be followed, "that the womb may contract and the mouths of the veins be shut up more closely." (Art of Mid. Improved, transl. 1728, p. 153.) And Dionis (Treatise on Mid., transl. 1719, p. 244) says that, in cases of hæmorrhage before delivery, "however little the womb is dilated, the membranes which contain the waters must be broke, that the distension may be taken off." So that it is plain Puzos was far from originating this improved method of treatment. Still, notwithstanding all that had been written on the subject, as little or no distinction was drawn between those cases in which the placenta presented first, and hæmorrhages of a purely accidental nature, the practice could not be considered as based on scientific or sure grounds, until Rigby, with the most praiseworthy zeal, directed his observant mind to the subject.

Nevertheless, the utility as well as the propriety, of rupturing the membranes in accidental hæmorrhage is denied by Hamilton,† Burns,‡ Stewart,§ and some other practitioners. Three great objections have been taken to the practice:‖—First, that gestation is necessarily suspended by the evacuation of the waters of the ovum; secondly, that the time is uncertain at which delivery will be perfected after the operation,—during which interval the dangerous symptoms may be much aggravated; and, thirdly, that as puncturing the membranes will not always suspend the flow of blood, should delivery become requisite, its performance will be rendered extremely difficult, in consequence of the powerful contraction of the uterine parietes around the fœtal body. To the first objection the answer is easy and conclusive; for, since we may presume that labour has already commenced by the dilatation of the uterine mouth, the process of gestation must have been arrested before the operation is resorted to. Even should the term of pregnancy be distant,—inasmuch as large losses of blood usually excite uterine action, and we may therefore presume that a premature expulsion of the ovum will ensue,—puncturing the membranes can but hasten the event; it does not originate the disposition. Besides, should the woman's life be endangered by the profuseness of the discharge,—since the probability is that the complete evacuation of the uterine cavity will alone place her in a state of safety,—the preservation of an immature fœtus cannot be put into competition with the chance of recovery afforded her. The uncertainty of time at which effective uterine action will be established, has been adduced as another serious objection; and this appears to me as untenable as the former: for in my own practice I have usually found the contractions speedily increased, both in frequency and strength, after the measure has been resorted to; and the same observation must be made on a perusal of the cases detailed by Rigby. The third objection, at first sight, would seem the most plausible; but I have already replied to it by observing, that if the uterus contracts powerfully enough to refuse admittance to the hand, its action will be sufficient to expel the fœtus, or at least, so to compress the open vessels as to put a stop to any further immoderate flow of blood. But if confirmation were required, I might with confidence advert to the experience of Rigby, Merriman, my father's and my own, in corroboration of the statements which I have just advanced.

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* This measure is sanctioned by the authority of Denman, Baudelocque, Merriman, Blundell, my father, and many other men of acknowledged practical experience. Rigby has reported a great number of cases in which the rupture of the membranes entirely suspended the previous discharge,—and he states that he never had occasion to turn the child in any instance where this expedient was resorted to. Merriman (Synop. p. 119) mentions that he has adopted the same means in upwards of thirty cases of accidental hæmorrhage; "that as yet he has had no reason to be dissatisfied with the plan, for in every instance the discharge has either entirely ceased or been so much diminished as to secure the safety of the patient; and yet there were some among these patients whose cases, from profuse hæmorrhage, were abundantly alarming." In my own practice, out of twenty-five successive cases of this kind, of very aggravated nature, occurring within the space of eleven years, in twenty-three instances the labour was terminated naturally and safely after the rupture of the membranes, and in two the loss of blood had been so profuse, before I saw the patients, as to induce me to deliver artificially; in both instances, with a fatal result.

† Pract. Obs. 1840, p. 331.

‡ Princip. of Mid. 5th edit. p. 318.

§ On Uterine Hæmorrhage, p. 92, &c.

‖ See Dewees, parag. 1051, *et seq.* He only admits puncturing the membranes to be safe when the os uteri is dilated or dilatable.

For reasons before given, I consider it my duty strongly to recommend this practice in preference to immediate delivery: for my opinion is perfectly at variance with Professor Burns,[*] who asserts that experience has taught us puncturing the membranes cannot be relied on. On the contrary, we may affirm that experience taught Smellie,[†] Denman,[‡] Rigby,[§] Merriman,[‖] Blundell,[¶] Davis,[**] Conquest,[††] Ingleby,[‡‡] and many other eminent men, not only of this country, but on the continent also, that this easy and gentle expedient could be trusted in the great majority of instances; and personal observation has long impressed me with the conviction of its high value. Nor am I more disposed to agree with the Professor in his eulogium on the use of the plug,[§§] in cases where rigidity of the os uteri precludes the possibility of immediate delivery, although sanctioned by the authority of Dewees,[‖‖] Capuron,[¶¶] Gardien,[***] and Dugés,[†††] because, notwithstanding the blood may be prevented flowing externally, it may still collect in such quantities in utero as to destroy life.[‡‡‡] If such be the case, then, the *tampon* must prove a dangerous application, and should not supersede the rupture of the membranes. It is certainly possible that completely filling the vagina may be advantageous in cases where the membranes are broken, where the os uteri continues rigid and undilated, and where any attempt at delivery must be attended with danger to its structure; but such cases, at the full period of pregnancy, according to my own experience, I should look upon as very rare indeed.

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[*] Principles of Mid. 5th edit. p. 318.

[†] Vol. i. chap. iii. sect. 3; see also vol. ii. p. 268, and vol. iii. p. 113.

[‡] Chap. xv. sect. 7.

[§] On Uterine Hæmorrhage, 4th edit. p. 31.

[‖] Synopsis, p. 118.

[¶] Obstetricy, by Castle, p. 454.

[**] Obstetric Med. p. 1053.

[††] Outlines of Mid. p. 157.

[‡‡] On Uterine Hæmorrhage, p. 125.

[§§] Op. Cit. p. 302.

[‖‖] Parag. 610 and 1027.

[¶¶] L'Art des Accouchemens, p. 391.

[***] Traité d'Accouchemens, vol. ii. p. 414.

[†††] Man. d'Obstetr. deuxième édit. p. 230.

[‡‡‡] The practitioners, indeed, whose names I have quoted in the text, deny the possibility of such an occurrence; while those of our own country (particularly Hunter, Denman, Barlow, and Merriman) look upon the uterus, at the termination of pregnancy, as capable of containing a body much larger than the ovum, and fear an internal accumulation of blood in consequence of its distensibility. Of this fact, indeed, more than one instance has come within my own knowledge.

After the evacuation of the liquor amnii, the ergot may be administered with advantage—unless, indeed, the mouth of the womb be preternaturally rigid: stimuli may be required if the patient be much depressed; but opium, for the reasons more than once adduced, I should avoid. Friction and moderate pressure on the uterine tumour, may have the effect of exciting increased action, and the dilatation of the os uteri may be forwarded by the fingers introduced carefully within it during a pain—a means recommended by many practitioners, but one which I have myself seldom found it necessary to employ. Sometimes the hæmorrhagic symptoms may be more strongly marked than can reasonably be accounted for by the quantity of blood lost externally. Under such circumstances, there is good reason to apprehend that flooding is going on into the cavity of the womb itself, and that the blood, for some unascertained reason, is prevented escaping. And this especially, if with the ordinary indications of hæmorrhage, a constant cramp-like pain be felt in the abdomen, situated, indeed, in some part of the uterine tumour, and produced by the distension consequent upon the internal accumulation. It has occurred to me to meet with a few cases of this kind of concealed hæmorrhage; and they have all been attended with this distressing pain, or feeling of tightness, very different in character from that occasioned by uterine action.* The case may prove embarrassing, since the cause is not immediately evident; but, being discovered, the same means should be taken to stop the further loss, as would be had recourse to were the blood flowing through the external orifice.†

Should the discharge continue to flow outwardly with profuseness, or should indications of internal bleeding be present, delivery must be had recourse to without delay, as offering the only reasonable chance of safety.‡

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* See a case in point in the Medical Institute, Feb. 15th, 1851, by Dr. Barker, of Bedford. Also my father's remarks, Pract. Observ. 2nd edit. p. 268. Part ii. p. 117 of the first.

† I have not found so much relief from the exhibition of opiates in these cases as is usually experienced in pain of a spasmodic nature.

‡ On the subject of hæmorrhage before delivery, I would strongly recommend the student to peruse with attention Rigby's Essay, already alluded to, as well as the more recent treatise by Ingleby, on Uterine Hæmorrhage; with most of the observations contained in which I perfectly coincide.

Placental presentation complicated with transverse position of the fœtus, or small pelvis.—It must be evident that when the placenta is situated either entirely or partially over the os uteri, the child may present with the breech or transversely. Under an *entire* placental presentation, such a preternatural position of the fœtus would not influence our practice; because delivery would be required, not in consequence of the mode in which the child lay in utero, but because of the unfortunate misplacement of the placenta itself;—and, indeed, it is more than probable that its position would not be detected until the hand was introduced into the uterine cavity: under either case extraction must be made by the feet. Should the placenta, however, but *partially* occupy the orifice, while the breech is at the brim, the membranes may be ruptured and time allowed for its descent, provided the flooding be restrained. But, on the other hand, if the child lie across the pelvic brim, it would be better to undertake the delivery at once—to treat the case indeed as a transverse presentation—proceeding with extraction as slowly as is consistent with the safety of the infant.

A placental presentation may also be complicated with a distorted pelvis; so that, though we may have turned the fœtus and brought down the breech and body, we may be unable to extract the head. Under such circumstances, the cranium must be perforated in the manner before explained.* This is a complication which seldom occurs, but it has happened to me to meet with three such cases, and very embarrassing I found them. Much time must be occupied in the delivery, and it might be imagined that during it the hæmorrhage would be profuse: such however, fortunately was not the case in either of the instances I attended. In all, the head was perforated behind the ear; and the delivery was accomplished with less constitutional distress than I expected.

Our first duty, then, in floodings before delivery, consists in ascertaining whether the placenta presents over the os uteri; and if so, whether the orifice be wholly or partially occupied by it. If it be found entirely covering the mouth of the womb, we must turn the child as soon as that organ is dilated to the size of half-a-crown, or even before, should it be sufficiently relaxed and the flooding continue to a violent degree; if partially, we may rupture the membranes—provided the head present—and hold ourselves in readiness to deliver by turning, expecting that probably the discharge, although it may abate, will not quite cease. If no part of the placenta be discoverable by the finger, we may rupture the membranes as early as possible, and hope by this means to put a stop to the hæmorrhage; but at the same time we must be prepared to turn, in case our expectations are disappointed. We may exhibit the ergot of rye in most cases; give stimuli if they be required; and should the os uteri be rigid and undilated under an entire placental presentation, or under a partial case, after the membranes are broken, we may perhaps venture to plug the vagina; but if we do this, we must keep a close watch on our patient, lest internal flooding be going on.*

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* Page 356.

HÆMORRHAGE SUBSEQUENT TO THE RUPTURE OF THE MEMBRANES.—A large loss of blood seldom occurs after the membranes have broken before the birth of the head, unless there have been hæmorrhage previously; but if a discharge should appear to such an extent as to call for our interference, delivery must be resorted to—by turning, if the head be above the brim of the pelvis, and the os uteri not thoroughly dilated—by the long forceps, if the head have entered the pelvis too low to allow of our raising it for the introduction of the hand into the uterus, but not low enough to enable us to feel an ear—and by the short forceps, or the vectis, if one or both ears be distinctly within reach of the finger. One or other of these methods will generally be found adequate to the end; but should there exist a small pelvis, tumours, or preternatural rigidity of the soft parts, we may be obliged to perforate the head.

It sometimes happens, that after the head is born, a considerable time elapses before the uterus again acts to expel the shoulders and body; and during this interval flooding may come on. In such a case we may endeavour to stimulate the organ to increased energy by pressure and friction, and the exhibition of the ergot; and we may expedite the delivery by gentle and careful traction, in the hope that the uterus will, as it were, follow the body of the child during its extraction, separate and throw off the placenta, and eventually close its cavity and seal its vessels.

HÆMORRHAGE AFTER THE BIRTH OF THE CHILD.—Hæmorrhage under labour by far the most frequently occurs after the birth of the child, and previously to the expulsion of the placenta; and the flow is often most sudden, unexpected, and profuse. At the very time, probably, when the husband and friends are congratulating themselves on what they consider the fortunate termination of the case, and when the medical attendant is joining in those congratulations, danger is insidiously hovering around, and death is sometimes rapidly, though secretly approaching.

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* Peu (Pratique des Accouchemens, 1694, p. 454), La Motte (Obs. 249), Levret (Accouchemens Laborieux, 1770, p. 205), and Baudelocque (parag. 1084, trans.), cite instances in which it was supposed that a rupture of the umbilical cord produced hæmorrhage after the membranes had broken; but in this case we should not expect the flow to be profuse, and as the blood lost would be entirely fœtal, no effect would be produced on the mother's system. This is a very rare complication of labour; and the belief in the possibility of its occurrence ought not to influence our practice one way or other.

Flooding after the child's birth is dependent on the same general causes as before its expulsion; namely, the separation of the placenta, more or less, from its uterine attachment, at a time when the womb, still containing the placenta, is unable to close its cavity so as to contract its vessels. We know that, unless the uterine cavity be empty, its perfect contraction is prevented, and consequently the complete closure of the vessels is impeded; and that so long there is a great probability, nay, almost a certainty, of hæmorrhage occurring. If then, the placenta be partially or wholly retained in the uterus, and a portion of it be separated from its attachment, the vessels must continue open, and the woman must therefore sustain more or less discharge.

There is always, as I before mentioned,[*] a certain amount of blood lost upon the separation of the placenta and its protrusion; usually not exceeding a few ounces: and this seems to consist of little more than that quantity which was contained within the uterine vessels, and which is squeezed out mechanically, through their open orifices, by the contraction of the uterine fibres; so that scarcely any is lost to the system generally. But when the discharge is copious, all the vessels of the body are proportionably emptied; and from the rapidity with which the blood flows, we cannot wonder at the instantaneous depression which sometimes follows.

It has been advised,[†] that immediately after the child is separated, and transferred to the care of an attendant, the right hand, carried between the thighs of the patient, should be placed upon the abdomen, to ascertain the state of the uterus, with regard to the degree of contraction it has taken on itself, and whether or not the placenta has passed from its cavity; and I have mentioned that there are five conditions, in which it may be found, differing essentially one from the other, and each indicating a state of greater or less security.

After having made this external examination, I have also directed that the first finger of the right hand should be passed into the vagina, to examine for the placenta, before the bed-side of the patient is left. I have stated that we may feel tolerably well persuaded the placenta is in the uterine cavity, if that organ be found large externally, but that we become positively certain, if, on running the finger along the funis umbilicalis up to the pelvic brim, we cannot detect the mass; because, if it were lodging in the vagina, it would be within our easy reach.

The reader will find at page 113, a caution against any attempt

[*] Page 118.

[†] Page 141.

to remove the placenta from the *cavity of the uterus* by traction at the funis umbilicalis. Such an attempt I look upon as dangerous, and therefore highly to be deprecated, unless the insertion of the cord be most easily discoverable, and unless the principal bulk of the mass can be perfectly surrounded by the finger, introduced as in a common examination; which indicates that it has passed entirely, or almost entirely out of the uterine into the vaginal cavity.

With these cautions in our mind, then, presuming the patient free from flooding, we are to wait a certain length of time for the expulsion of the placenta from the uterus: but that time must necessarily have a limit.*

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* The management of the placenta has at different ages been conducted on the most diametrically opposite principles. From the writings of Hippocrates (Liber de Superfœt. cap. iii.) we gather that it was not the custom to use any means but the most gentle for the purpose of extracting it; but Celsus (lib. vii. cap. 29) plainly counsels us to introduce the right hand into the uterus, and remove the secundines, *quoties infans protractus est.* Since, however, the chapter in which these words occur is dedicated to the method to be employed for delivering a dead child, and since they immediately follow his instructions to that effect, we may naturally conclude that this interference was only recommended after a forced delivery had been resorted to, and not in common natural cases; and the word *protractus* seems to favour such an opinion. It has been supposed, indeed, that Celsus counselled this hasty removal of the placenta upon all occasions; and Denman (chap. xv. sect. 8) has evidently adopted this view; but I cannot think it is justified by the expression employed. Ætius (tetrab. iv. sermo iv. cap. 24), who borrows this part of his work also from Philumenus, recommends that the placenta, when retained, should be removed by the introduction of the left hand; and that if the os uteri be shut, and the operation consequently rendered difficult, relaxing means should be used; that the endeavours, however, should only be persisted in for the first and second day, and if unsuccessful, that the woman must no longer be fatigued; for, in a few days, the mass will putrefy, and come away in a dissolved state. Paré (lib. xxiv. cap. 17) recommended the removal of the placenta immediately the child was born; but at the same time cautioned his readers that it was to be done in the gentlest and softest manner—first, by pulling at the funis; and if that did not succeed, by the introduction of the hand into the uterus. Paré's advice was but partially followed; the practice inculcated was implicitly adhered to for many years, while the excellent cautions by which it was enveloped were entirely forgotten; and hence the most disastrous effects resulted. The hand was rudely thrust into the uterus on all occasions, and the placenta as rudely torn away. Nor did this mischievous custom receive a check in England till Dr. Hunter determined to oppose it with all his authority; for the instantaneous withdrawal of the placenta was taught by Chapman in 1733, and sanctioned by Manningham in 1739, in the practice at the lying-in ward of St. James's Infirmary, which was the first attempt at the establishment of an hospital for parturient women in this metropolis. In Smellie, also, we find the same system prevailing, though in some degree modified. He directs us to let the woman rest a little after the fatigues of the birth, unless there be danger of hæmorrhage, "that the uterus may, in contracting, have time to squeeze and separate the placenta from its inner surface;" then turning the funis round two fingers, or wrapping it in a cloth, to pull gently from side to side, desiring the woman to assist our endeavours "by straining as if she were at stool, blowing forcibly into her hand, or provoking herself to retch, by thrusting her finger into her throat." If by these methods the placenta cannot be brought away, to introduce the hand and deliver it. (Chap. ii. sect. 5.)

Some years before Hunter commenced practice, Ruysch, whose name is justly

It appears to me that in the present day we are in the habit of following the most rational and judicious practice, in regard to the management of the placenta, which has ever been adopted. With the fatal consequences attendant on profuse floodings always before our mind, we do not hesitate to remove the placenta by the introduction of the hand into the uterus, as soon as a discharge occurs to such an extent as to bring the patient's life into the least peril: and we think ourselves warranted also in abstracting it by the same means, provided it is not expelled within a limited period. The time, therefore, that we are to wait before proceeding to withdraw it, becomes a matter for our consideration of deep interest; and I am fully persuaded that four hours, as advised by Hunter and Denman,* will in most cases be found too long. In my own practice, should there be no hæmorrhage, I am generally in the habit of delaying operating for an hour or an hour and a half after the child's birth; and I consider it most probable, provided the placenta is not expelled into the vaginal cavity at the expiration of that period, and there is not more than the usual discharge, that it will almost always be found extensively adherent to the uterine structure; for if morbid adhesion does not exist, we may expect that the mass will at any rate be partially separated, and hæmorrhage will necessarily result. Should this prove the case, then, it is most likely that every

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rendered famous as an anatomist, particularly by his employment of wax injections to aid in dissection, had been appointed President of the Obstetric College at Amsterdam, and was empowered by the magistrates to regulate the practice of midwifery in that city. Numerous cases having come within his knowledge, illustrating the fatal effects consequent on the barbarous custom of that age, he wrote with much force and ingenuity against it, forbidding the extraction of the placenta in any case; and from his spirited opposition we may date the commencement of the present improved practice. Ruysch certainly trusted in much too great a degree to the unaided efforts of Nature, and ran into the opposite extreme from the custom he deprecated. (Advers. Anat. Decas, 2, sect. x.) Much allowance must, however, be made for the strength of his language, and his universal reliance on Nature's powers, since his arguments were intended to uproot a most pernicious and dangerous practice; and they must be regarded, therefore, as those of a partial advocate. Hunter, induced by the same feelings, and having witnessed the same kind of calamities, adopted the system Ruysch was so powerfully advocating; and we are told by Denman, on the authority of Dr. Hunter himself, that after much thought and hesitation, his colleague in the obstetric department of the Middlesex Hospital, Dr. Sandys, and himself, agreed to leave the placenta to be expelled entirely by Nature, without attempting to render any assistance whatever. In the first instance in which this *experiment* was tried, twenty-four hours elapsed before the placenta passed; but as no ill consequences followed, the trials were repeated; and it soon became the general rule in that establishment to leave the expulsion of the mass to Nature's unassisted powers. The occurrence, however, of some fatal cases induced Dr. Hunter to modify his treatment; and it is well known that before his death, he was in the habit of removing the placenta by the hand if flooding supervened; and I believe he also recommended its withdrawal at the expiration of four hours from the child's birth, if it had not previously passed, although there might be no hæmorrhage.

* Introduction to Midwifery, chap. xv. sect. 9.

hour's delay will increase the strength of the uterine contractions around the placental body, and consequently add to the difficulties which will beset us in our endeavours to remove it.

Still, however, under these circumstances time must not entirely guide us, nor its lapse be our only indication for the removal. The state of the uterine contractions must not be overlooked. Should the womb be acting powerfully and vigorously, I should be induced to extract the placenta earlier than the specified period, under the belief that adhesion had taken place, or that irregular contraction in the uterine fibres was the cause of its being retained, and that Nature would not be able to surmount the difficulties of the case unaided: while, on the other hand, if the uterus remained inactive and sluggish, I might be inclined to delay longer, provided there was no alarming discharge, in the hope and expectation that it would, after the lapse of a little more time, resume its expulsive action, and that the case would be terminated without manual assistance; particularly if the contractions during the birth of the child had been feeble, or the labour lingering. I feel convinced that in the majority of those instances where the placenta has been naturally expelled after a retention of many hours, it has been lodging the principal part of the time in the vagina, totally excluded from the uterine cavity; and this I think very likely to have happened in the case related to have occurred under Dr. Hunter's superintendence, because the principle on which it was conducted was that of perfect non-interference.

Cases are on record in which the placenta never passed from the uterus at all; it having been supposed that the whole or the greater part of it had been absorbed by the action of the uterine vessels; and some physiologists are strong advocates for ascribing to the uterus the power of absorbing portions of placenta, when left after the child's birth.* Knowing the astonishing resources which Nature possesses, and the wonderful contrivances she adopts for the purpose of restoring the system to a healthy state, we should scarcely have the temerity to deny the possibility of such an occurrence, even were it not contended for by respectable authority; but we should certainly not expect that the placental mass, or any great proportion of it, would be removed by such means; and we should be acting most unwisely if we were induced by that hope to leave it in the uterus, without making efforts to extract it.*

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* Náegelé entertains this opinion; (see a communication by Merriman in Med. Gaz. vol. iii. p. 189, of part of a paper furnished by Náegelé to Dr. Von Frorirep's periodical, "Notizen aus dem Gobiethe der Natur und Heilkunde," where four instances of permanent retention of the whole placenta, and one of a part, are recorded.) So does Professor Salomon of Leyden; (see Rigby's Mid. Reports, Med. Gaz. vol. xiv. p. 334.) Two instances are there mentioned, in which no part of the placenta at full time ever passed away. One related by the late Dr. Young of Edinburgh, the other by Professor Salomon. Dr. Rigby follows Náegelé in this, as in most other of that distinguished physician's views. Velpeau cites three cases which he had seen, where, after abortion, the placenta did not come away; he thinks these were absorbed, and seems inclined to believe in the possibility of the same process taking place after delivery at full time. (Traité des Accouch. Art. Résorption du Délivre.) To this work I would refer the reader for a notice of the chief number of well-attested cases of this description on record. Ingleby (on Uterine Hæmorrhage, p. 206) coincides in the possibility of absorption; but supposes that the absorbent vessels themselves, and not the veins of the uterus, are the agents of its removal. On the other hand, the late Dr. Rumsey, in an inaugural thesis, published

RETENTION OF THE PLACENTA.—The placenta may be unduly retained in utero by three different causes, each acting separately, or two in concert. They are *first*, atony of the uterus; *secondly*, spasmodic or irregular contraction of the uterine fibres; and *thirdly*, morbid adhesion having taken place between the placental and the uterine surfaces.†

Retention from atony of the uterus.—It is generally observed, that when a want of due and sufficient energy on the part of the uterus prevents the proper contraction of its fibres, for the purpose of expelling the placenta, the occurrence takes place in cases where the woman has had a number of children—where the uterus has been acting feebly during the previous stages of the labour—where a long interval has occurred between the expulsion of the head and the passage of the shoulders: after lingering labours also; and in cases where the patient has been delivered by instrumental aid, in which the uterus has become worn out,

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in 1837, combats the idea of the whole or any portion of a disruptured placenta ever being absorbed: he thinks that when not expelled entire, or broken down by putrefaction, the parts left behind become organised and amalgamated with the structure of the womb itself.

* In the year 1829 I was requested to visit a young woman, on the sixth day after delivery of a first child, in consequence of the placenta being still retained in utero. I learned from the gentleman who had attended the case, that the labour had been lingering; that the child at full time was born dead; that the funis had broken from the placenta soon after the birth, and that the mass had never come away; but that there had been no hæmorrhage. I found the uterus painful, and considerably larger then it should have been, had the cavity been empty; the discharge from the vagina was scanty, and slightly putrid. The os uteri was almost closed, and I could feel no part of the placenta. She was suffering under a slight degree of fever; but there were no urgent symptoms of immediate danger. Two days afterwards she appeared much in the same state. My friend watched her narrowly for more than a month, during which time a portion of placenta, the size of a walnut, was expelled. She recovered her health perfectly, and returned to her friends, whom she had been obliged to leave, as she was unmarried, in about six weeks. I am informed that nothing more passed of a solid character; but whether she ever menstruated after I do not know. I shall not enter into any speculations on the case, as to whether absorption may have taken place, or what change may have occurred in the placenta itself; but I place every reliance on the statement, that so long, at any rate, as she remained under my friend's immediate superintendence, the placental mass did not escape from the vagina.

† Adhesion may exist in combination with atony, and also with spasmodic contraction.

and the powers of life are much depressed. It is equally likely to happen if, when the head is expelled, the attendant has suddenly, forcibly, and improperly extracted the fœtal body from the uterine cavity; after which reprehensible interference the womb is left in a flabby, relaxed, and torpid state, disinclined to continue its active contractile efforts for the expulsion of the placental mass.

We may know that the placenta is in utero by observing, on the application of the hand externally, that the organ is larger than it should be if emptied; and by feeling that no part of the placenta, or only a small portion of it, is protruded into the vagina. But do we know why it is retained in the uterus?—Can we tell which of the three causes I have mentioned is in operation?—We cannot discriminate *positively*, except under the introduction of the hand into the cavity itself; but our *suspicions* as to the true cause may be strong, and probably correct. We may presume that atony is the cause, if after the birth of the child, the uterus remains soft, large, and flabby; if there be no after-pains; if, when we take hold of the funis—and this is a good indication—we find that the vein is not full, that it is quite flaccid; because, if the placental mass be squeezed by the uterus contracting upon it, the blood will be forced down from it into the cord, under which action the arteries and vein become turgid and distended: and we may frequently observe it twist in a trifling degree, or writhe spontaneously, somewhat like an eel, as often as a fresh contraction occurs in the uterine parietes. This twisting is produced by the blood passing gradually downwards along the vessels, which are seldom straight, but almost invariably follow a spiral course, and being prevented escaping by the ligature binding their cut extremities.

Where the placenta is retained by atony of the uterine fibres, the blood is, generally speaking, poured out in a copious stream, provided any portion of the organ be separated from its previous attachment; because the uterus being uncontracted, its vessels continue large: and their open orifices are not plugged in the least degree, as occurs when the womb has contracted itself strongly around the mass which it holds within its cavity.

Treatment.—What method, then, shall we adopt under this state?—Are we to remove the placenta immediately hæmorrhage shows itself, by introducing the hand into the cavity of the womb; or can we stimulate the organ to contraction, so as to induce it to throw off the mass without the necessity of so harsh a proceeding?—By pressure, friction, and the application of cold, we may often excite such efficient action that it will gradually descend into the vagina, and the introduction of the hand be rendered unnecessary. But we must always bear in mind, that these means ought not to be trusted to exclusively and entirely, under a continuance of copious discharge; and that most frequently the manual removal of the placenta from the uterine cavity itself will alone check the flow, and place the patient in a state of safety.

If, under retention from atony of the uterine structure, there be little or no sanguineous appearance, and no disposition to faintness supervene, fifteen or twenty minutes may be allowed to pass without any artificial means being used to solicit the renewal of uterine action. On the expiration of such a period, pressure may be applied to the uterus by the hand placed externally; or gentle friction may be made over the hypogastric region. Should an unusual discharge of blood now take place, cloths dipped in cold vinegar and water may be suddenly laid upon the lower part of the abdomen and the vulva, and the pressure and friction persevered in; and should the discharge continue to an alarming extent, or increase to a profuse hæmorrhage, the removal of the placenta must at once be undertaken. All other considerations must give way to procuring an emptied and *contracted* state of uterus; and that can only with certainty be accomplished by the withdrawal of the mass. Many a woman has fallen a victim to the timidity of her attendant; many a life has been sacrificed by the trial of trifling means, perfectly inadequate to the production of the grand end proposed—the evacuation of the uterine cavity, the contraction of its parietes, and the perfect closure of its vessels. I should have but little faith in the efficacy of cold water injected into the uterus, while the placenta was retained within the cavity, although strongly recommended by Gooch.* It may be useful in floodings, after the placenta is expelled, but even then it can by no means generally be resorted to, because the necessary implements may not be at hand. And I should have still less faith in emptying the umbilical vessels of their blood, with the hope of diminishing the size of the placenta, as suggested by some physicians; † or in injecting the umbilical vein with cold water,‡ diluted vinegar,§ or brandy,‖ or any kind of astringents, as practised by others: the great objections to all these measures being, that while we are employing them, the blood may be gushing from the uterus, and the patient may be dying; that we are uncertain whether morbid adhesion may not exist at the same time, in conjunction with deficient energy in the uterine fibres, which may eventually require manual separation; and that the introduction of the hand is the strongest provocative to uterine action of any means we can resort to. The same objections apply to throwing purgative clysters into the rectum, as noticed by Blundell;[*] as well as to the use of the ergot, which, although it have the power of exciting contraction in the uterine fibres, requires some time for the establishment of its action; and, if morbid adhesion existed between the placental and uterine surfaces, it must fail in causing the expulsion of the mass even were its administration to be followed by powerful pains.

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* Compendium by Skinner, p. 172.

† See page 138, note.

‡ Taroni; Rev. Med., Sept. 1827.

§ Mojon; Nuevo Mezzo di Estraere la Placenta, &c., 1825.

‖ Hoffman; Ann. Univers. Juin, 1827.

When the necessity, then, for the removal of the placenta is apparent, and we dare no longer trust to more mild and less effective agents, the operation must be undertaken in the following manner:—

The patient lying on her left side, rather across the bed, with her nates brought conveniently near the edge, we must take off our coat—as in all cases where it becomes necessary to introduce the hand into the uterus; — denude the left arm and grease it; [†] then kneeling down by the bedside, we bring the fingers into the form of a cone, twist the funis umbilicalis two or three times round the first and second fingers of the right hand, to give us a guide to the placenta, and quietly insinuate the left into the uterus. There is little or no difficulty in passing it through the external parts, vagina and os uteri, if the operation be undertaken within an hour or two of the child's birth; nor is there any difficulty in introducing it fully into the uterine cavity, because the parietes are then in a flaccid condition, and the cavity itself is both considerably distended, and readily dilatable.

The removal of a placenta from the uterus, indeed, retained by simple inertia, is one of the easiest operations in surgery; but the condition requiring its adoption is of a highly dangerous character; and the danger will be in proportion to the facility with which the organ admits the hand. The danger, then, is not that we should bruise or lacerate its structure, or dispose it to inflammatory disease, but that we should leave it in an uncontracted state after the placenta is withdrawn, and consequently subject the woman to a continuance of the hæmorrhage. It certainly more frequently happens, that the stimulus of the hand causes the uterus to act, and that, in contracting, it expels the hand and placenta together;

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[*] Obstetricy, by Castle, p. 616.

[†] Hamilton (Pract. Obs. p. 171) strongly recommends the right hand to be used for the removal of the placenta from the uterus; as do other practitioners. My reasons for employing the left will be found at page 371. I would recommend in all cases of operation, whether instrumental or manual, that the patient's person should be placed *across the bed;* the shoulders, and consequently the head being bent rather forwards, so that a somewhat acute angle may be formed by the junction of the thighs with the pelvis; if this posture be chosen, the *left* hand will be found more convenient than the *right,* whenever it is necessary to introduce either into the uterine cavity.

and this is a fortunate occurrence;—it is to be hailed as the best proof of safety.

Whenever we are compelled to resort to manual extraction, we must bear in mind, that previously to the introduction of the hand, we cannot tell in what situation we may find the placenta; it may be entirely thrown off from the uterine surface, and lying loose in the cavity; or it may be partly separated, and partly attached; or it may be partially, or through its whole extent, morbidly adherent. For these reasons we must not always calculate on meeting with so easy a case as I have just described; we must not suppose that all we have to do is to introduce the hand and draw out the placenta. If we act in this way, we may find the case much more difficult than we expected; we may lose our presence of mind; we may withdraw our hand in doubt and disappointment, cause a serious aggravation of the flooding, and increase the previous peril. Let us, then, before operating, make up our mind to have to encounter the most difficult of all the cases of retained placenta which can possibly occur; and should we find it more easily managed than we anticipated, our error, if it be one, is on the right side.

I will suppose that it is partly attached, but not morbidly adherent. We pass the left hand gently into the uterus, guided by the funis; and on its introduction place the right hand between the woman's thighs on the abdomen, to steady the uterine tumour externally; for that organ being so much smaller than it was before the birth of the child, the parietes of the abdomen do not support it, but it rolls about in the abdominal cavity, and its unsteadiness greatly impedes our endeavours to remove the mass. When the hand has fully gained possession of the cavity, we tear the membranes with our fingers, and passing them between the placental and uterine surfaces, run our hand all over the maternal face of the placenta, to be certain that we have got the whole organ within it, and grasp the uterus externally with the right: it is most probable that, from the double stimulus thus applied, — that of irritation within, and compression externally,—a contraction will occur; we may then quietly withdraw our hand, retaining the placenta within its hold. Should, however, this desirable action not supervene, we may keep it a short space within the cavity, and endeavour to insure contraction, by gently moving our fingers, so as to irritate the parietes in some trifling degree.

On the entire withdrawal of the mass—whatever may have been the cause that compelled us to have recourse to its removal manually—we must never forget to examine whether or not it be entire; for it is possible that the whole may not have been extracted. It is not unlikely that adhesion may have taken place between a portion of its structure and the uterus itself; that instead of passing the hand over its whole face, we may have broken it and brought away only a part, leaving the remainder in the uterine cavity. To assure ourselves that we have removed it all, we must lay it upon a napkin, with the maternal face upwards. If there be a considerable portion wanting, we cannot be deceived; we observe that the mass is broken, and we see the cavity from which a piece has been separated.* If, then, we find that a third, or a quarter, or any other large quantity be missing, we should immediately introduce the hand a second time; for it is much better to remove the disrupted portion than to leave it to be thrown off by Nature. This should be done before the uterus is contracted around it; and if much difficulty be experienced, we must desist from our attempts. But if there be only a number of small filaments left, it would be injudicious to make any exertion for their removal; since we must put the patient to much pain, run the risk of doing permanent injury, and in the end, most likely, not accomplish our object.

Retention from irregular contraction.—The second cause of retention is irregular contraction in the uterine fibres. This generally happens after the uterus has acted powerfully, when the child has been very rapidly expelled,—its whole body being projected forth probably by one pain,—and when under the same action the organ has contracted strongly around the placenta; or where improper attempts have been made to remove it from the uterine cavity by pulling and jerking at the funis. In this case, then, either all the fibres shorten themselves simultaneously, or some are in a contracted state while others are dilated; instead of the action being regularly progressive from the fundus downwards. Upon this occurrence taking place, three or four strong pains will most likely follow each other in quick succession, soon after the expulsion of the child; and sometimes they are almost as severe as those experienced before the infant's birth. If, after a succession of such powerful contractions, the placenta does not descend within reach of the finger, if the funis umbilicalis become full and turgid with blood, and if the uterus feel very hard, as well as large, to the hand externally applied, these symptoms are suspicious of the state I am describing. Generally speaking, under these cases there is not such violent hæmorrhage as when atony is the cause of delay; and some time may frequently elapse without there being such a degree of flooding as would induce us to introduce the hand for the removal of the placenta.

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* From the neglect of this very simple proceeding, I have known many cases of great danger occur. A medical friend called me to his assistance on the appearance of violent hæmorrhage, after, as he believed, the placenta was removed. Immediately I placed my hand on the abdomen, I felt satisfied that the whole, or principal part of it, was still within the uterus; but, on inquiry, was informed that it had come away on the application of the slightest traction possible. On requesting to inspect it, a utensil was brought which it was supposed contained the placenta. There was the funis entire—there were all the membranes—and there was a large mass that looked like the placenta lying below the membranes. On turning it up, however, no part of the placenta was there. The cord and membranes had slipped away from their attachment to its body, and a large quantity of blood had collected within the membranes and there coagulated, which was mistaken for the placenta itself. If, instead of being satisfied with the appearance of the funis and fœtal membranes, my friend had made his examination, as I have just recommended, the mistake could not have happened; and the cause of the continuance of the hæmorrhage would have been at once apparent. For a case almost precisely similar, Velpeau (edit. Bruxelles, p. 309) may be consulted. Another of the same kind was reported to me by one of the surgeons of the Royal Maternity Charity in April 1841, as having come under his notice.

Let us, however, not wait longer than the limit before assigned —one hour and a half, and in the mean time we may consider whether we can, by any internal medicines or outward applications, overcome this spasmodic state. External means seem of little service, and of all medicines, opium, perhaps, is the only one which can procure the relaxation sought. It is, indeed, very generally recommended under this state. Opium in moderate quantities I should not object to; but I am decidedly adverse to its employment in large doses; because its influence may be greater than we anticipated—the opposite condition to that previously existing may be produced; the uterine powers may be paralysed; and, although the difficulty in the removal of the placenta may vanish, the contractions necessary for the ultimate safety of the woman may never be resumed. Again: it is more than probable that adhesion may co-exist with this irregular action; and if such be the case, the introduction of the hand will eventually be required. Still greater objections apply to the abstraction of blood by the lancet, for the purpose of relaxing this spasmodic contraction—a means which has occasionally been resorted to;* but which I should strongly deprecate, even although there might be no flooding; for I should dread the probability of a copious discharge from the uterus, so long as that organ remained unemptied and uncontracted. Should apoplexy or convulsions, indeed, occur immediately on the child's expulsion, bleeding would be indicated, and it might be highly proper to open a vein, even before any part of the placenta passed into the vagina; but I am now speaking of venesection as a means of overcoming that spasmodic state of the uterus which prevents the placenta descending.

On the other hand, I should equally object to the use of those

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* Gardien (tom. iii. p. 256) recommends bleeding in conjunction with other means, before an attempt is made to remove the placenta manually. Blundell (Obstetricy, p. 625) thinks some few cases might justify the us[illegible]he lancet; and states that he has abstracted sixteen or twenty ounces of blood with the view of producing relaxation. Ingleby (Ut. Hæmor. p. 198) says, "This measure will rarely be found admissible, except in the instances of plethoric women, and in the absence of hæmorrhage."

means which will increase the tone of the uterus—such as the ergot of rye. In my own practice, indeed, I am in the habit of relying only on the careful removal of the placenta by manual operation;—the indications being lapse of time on the one hand, and flooding on the other.

Irregular contraction is of various kinds. Sometimes the uterus contracts globularly on the placenta, (Plate 79, fig. 1,) sometimes longitudinally, assuming somewhat the shape of a sugar-loaf; at others, it contracts with a corner, (fig. 2,) so that in one part or other there is a sac, in which the principal bulk of the placenta is retained; the other portions of the organ being in a relaxed state. Sometimes it contracts with a sharp ridge anteriorly, something like a hog's back; but this is rare. At others, again, the central fibres of the body of the uterus act powerfully, leaving those of the fundus and neck uncontracted, and the hour-glass state is produced, (fig. 3;) the placenta being prevented from descending, by the constricted ring formed by the circular fibres of the body.*

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* We hear much of hour-glass contraction of the uterus, but my belief is, that there is no rarer case met with in obstetric practice than the real and true hour-glass contraction, such as I have described. Professor Burns, indeed, states, that "in almost every instance this contraction takes place; that he scarcely ever introduced his hand into the uterus, in a case of flooding, without meeting with it, whether the placenta had or had not been expelled."—(Princip. of Mid., 5th edit., p. 485.) Burns' authority is great on all subjects connected with the obstetric department of medicine, but in this sentiment I can by no means concur; and I am certainly not singular in my opinion; for Ingleby (Op. cit. p. 192) looks upon this case as of very rare occurrence. Blundell (Obstetricy, p. 623) says, "It does not happen so often as many imagine," and other practical men have expressed themselves in similar terms. I can scarcely suppose Professor Burns himself could be mistaken, and presume (although this does not appear from his writings) that he and I do not apply exactly the same meaning to the term "hour-glass contraction." I am however persuaded that the general idea of the occurrence being so frequent, has its origin in error:—that the contraction of the uterus, indeed, is of the globular kind; that its whole cavity is considered the upper chamber; the os uteri being taken for the constriction of the central fibres of the body, and the dilated vagina,—having in it a coagulum of blood,—for the lower chamber. In many cases I have been told that an hour-glass contraction existed, but when I came to examine for myself, I found it was of a mere simple globular kind. Out of a very large number of instances, in which I have been called upon to remove the placenta, I do not recollect to have met with more than three or four that perfectly agreed with my idea of the true hour-glass contraction. Some practitioners, again, consider that the hour-glass contraction *never* occurs; and that therefore the idea of detention of the placenta from this cause is entirely hypothetical; (see a letter by Mr. Moss, of Eton, Med. Gazette, vol. vi. p. 172; also another by Sir John Chapman of Windsor, same volume, p. 400.) Campbell (System of Mid. p. 205) says, "he never met with hour-glass contraction, and thinks it very rare, or that it does not exist at all;" and Murphy (Lect. on Mid. p. 363) "does not think it at all so frequent as is described." By all these gentlemen the case is accounted for as by myself. See also Baudelocque, vol. ii. trans. parag. 969. Mr. Robertson, lecturer on Midwifery, University and King's College, Aberdeen, (Med. Gazette, December 31, 1841, p. 543,) says, "In all my practice, consisting of upwards of twelve hundred cases, I have never met with a case resembling what is called hour-glass contraction. I have been called on several occasions by my professional brethren in consultation, where the placenta has been incarcerated in the uterus, and

The danger of flooding is not so urgent in irregular contraction as when the uterus is in a state of atony, but the operation of removal is both more dangerous and difficult, because of the resistance necessary to be overcome: and in proportion to the strength of the spasm will be the probability of injury.

Treatment.—Since, then, there is so much more chance of injuring the uterus, it behoves us to be so much the more cautious in our proceedings. If there be no flooding, we may generally wait an hour from the birth of the child; and in the interval, we may administer small doses of laudanum occasionally; but if hæmorrhage come on, we should not perform our duty, did we delay the employment of more active means a single minute. We must, then, make up our minds to meet with a certain degree of resistance, and we must overcome it in the softest and most gentle manner. Having taken off our coat and anointed our hand and arm, we kneel by the bed-side, and introduce our hand, previously gathered into the form of a cone, fully into the vagina. When we arrive at the os uteri, we must dilate it with the greatest care, using a slow boring motion, and steadying at the same time the uterine tumour with the right hand applied externally. The hand having entered the cavity, must be passed behind the placenta, between its maternal face and the uterus, as before directed; it must be carried over the whole surface of the mass, to ascertain that no part remains adherent, and when we have embraced it all within our grasp, it may be withdrawn. The uterus will most probably act forcibly, on the introduction of the hand into its cavity, and after the separation is effected, will expel it and the placenta together.

It might be supposed that cases will occasionally happen, in which, after the child's birth, we could not introduce the hand for the removal of the placenta. It is possible, certainly, that the uterus may take upon itself such violent contraction immediately, as to offer an insuperable barrier to the passage of the hand; but I never met with a case of this kind when the operation had not been deferred much beyond the limit I have assigned for our more passive treatment. I never saw an instance, within a few hours after the birth, in which, by care, tenderness, and perseverance, I could not introduce my hand, and that without injury to the uterine structure, provided the term of gestation were nearly completed. Our obvious indication, if we are foiled, would be to place the patient in some degree under the influence of

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the *os uteri* closed." Dr. Douglas of Dublin thinks this particular kind of contraction rarely or never exists, without adhesion of the placenta to the uterine surface (Trans. Roy. Col. Phys., Dublin, vol. vi., p. 393.) Meigs (Obstetrics, p. 339) is of the same opinion; and I myself believe, that adhesion is generally present not only with the hour-glass, but with most irregular contractions also.

opium, or perhaps of chloroform, and take advantage of the earliest opportunity of its action to renew our attempts: for the longer we wait, the more difficulty we shall experience from the permanent contraction which will assuredly take place, and which we have no means, as far as I have been able to judge, of removing.

Another kind of irregular contraction sometimes occurs—the too rapid closure of the os uteri during the passage of the placenta through it; by which action the mass is detained prisoner, lying partly *in utero*, partly *in vagina*. Any attempt to draw it forth by pulling at its edge will usually be followed by a laceration of the placenta itself, and a cautious dilatation of the orifice, by the fingers introduced *seriatim*, is generally required for its removal. At first, the constricted ring strongly resists our efforts; but when it once begins to yield, it gives way rapidly, and easily admits the hand within the uterine cavity.[*]

Retention from morbid adhesion.—The last case is the most difficult of all: that in which morbid adhesion takes place,—agglutination between the two surfaces of the uterus and placenta,—in consequence, most probably, of a deposition of coagulable lymph, the produce of a peculiar kind of inflammation which the lining membrane of the uterus has taken upon itself during pregnancy.[†] The connexion may be of greater or less extent,

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[*] See Hamilton's Pract. Obs. 1840, p. 178. This case I have frequently met with.

[†] Many reasons induce me to believe that this morbid adhesion is produced by the formation of a fresh membrane, the consequence of inflammatory action existing in the uterus. In the first place, we find adhesion of the placenta more frequent in the lower classes than in the higher circles; and this is easily explained by the greater liability of the poor to such accidents during pregnancy as are likely to originate inflammation in the uterine structure, and which may terminate in the agglutination of the two surfaces together. (For the same opinion, see Davis, Obst. Med. p. 1062.)

I have often myself known adhesion of the placenta follow an injury during gestation; and I have frequently inquired of my patient, after having removed an adherent placenta, whether she has suffered pain in the belly during pregnancy, and her reply has very usually been, "Yes, just where your hand was,"—my hand, for the purpose of separation, having been carried to the part where agglutination had taken place. From observing, then, that the patient, while pregnant, has had a fall, or received a blow; that she has experienced pain, evidently the result of inflammation,—I think there is no doubt that the morbid union is the effect of the same kind of action in the vessels of the uterus as occasions the formation of false membranes in other parts of the body; and I see no reason to believe otherwise. I do not mean to state that adhesion will be met with in every case where pain in the region of the uterus exists during gestation, because that pain may be spasmodic or neuralgic, and not the effect of inflammatory action; besides, the whole structure of the organ need not be the subject of the disease, although it were inflammatory: the lining membrane may possibly escape, and even should this membrane be implicated, the affection may be situated in a part remote from the implantation of the placental mass, and consequently no change can be expected to occur at that particular spot. Again, let us suppose that the very point at which the fœtal organ is attached has become the seat of injury and subsequent inflammation, still it is evident that resolution may occur,—that effusion of lymph need not and of a higher or lower degree of intensity. Sometimes the whole placenta becomes united by adhesion, of which I have known instances; at others, the part adherent may not exceed a sixpence in extent; but the union may be so firm that the unaided efforts of the uterus, however strongly excited, are not sufficient to produce an entire separation. Professor Burns[*] mentions a case in which the placenta was retained four days, and a fatal termination ensued, although the surface morbidly adherent was not larger than a shilling.

As a general principle, the larger is the surface detached from the uterus the more copious will be the hæmorrhage, because the greater is the number of vessels opened; and if the adhesion be entire, the loss of blood will be but very trifling; none indeed flowing out of the vessels in connexion with the placenta, and all that passes being afforded by the small arteries which communicated with the deciduous membrane.

Whenever half an hour or an hour has elapsed since the birth, without the appearance of any discharge, while at the same time three or four smart uterine contractions have taken place, we may begin to suspect not only that the placenta is morbidly adherent, but that throughout its whole extent; because if any part were

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take place, and that no difficulty may arise in the labour; so that there are a great many chances against the production of the effect I am describing.

My belief, however, that this morbid adhesion is caused by inflammation of the lining membrane of the uterus, is also strengthened by having observed this state occasionally follow accidental hæmorrhages towards the close of pregnancy. Cases are not unfrequently met with in which two or three eruptions of blood having taken place, consequent on some external and easily assignable cause, the hæmorrhage gradually ceases, and does not return; but, under labour, adhesion of the placenta is discovered. I presume, under such circumstances, that the cessation of the discharge depends upon an agglutination of that portion of the placenta, previously separated, with the uterus; nor is the explanation difficult. The two surfaces remain in contact, though not attached, having been disunited from each other by some accidental cause; and, to prevent a continuance of bleeding, and to save life, Nature makes a strenuous effort; inflammation is set up in the membrane of the womb, by which the placenta is glued to the uterine surface, and thus the open vessels are permanently closed. Such a process is not more extraordinary than many of the contrivances to avert danger, which we daily observe Nature to practise, and quite in accordance with the mode she generally adopts to repair injuries.

Moreover, I have had occasion to notice, in an early part of this work, that disease sometimes takes place in the placenta itself. Occasionally the mass becomes studded with tubercular formations, like small skirrhous glands: sometimes there are spiculæ or granules of bone strewed, as it were, over the maternal surface, and sometimes the organ becomes almost cartilaginous throughout; at others, preternaturally soft; these states being frequently connected with adhesion under labour. It is fair to presume, then, that the uterine membrane is excited and irritated by contact with the diseased mass, and that inflammation is the primary, and effusion of lymph the secondary, effect.

When all these circumstances are considered in conjunction, there can be little doubt that the morbid change occasioning adhesion of the placenta is to be referred to excitement of the *uterine* vessels as the immediate agents, and not to the *fœtal system.*

[*] Op. Cit. p. 490.

separated, some vessels must be rendered patulous. This is certainly a rare case, but it has happened to me two or three times to meet with it.

The intensity varies in degree as much as the extent: it is sometimes so slight, that, notwithstanding the uterine powers cannot accomplish the expulsion of the mass, yet it may be separated by the hand with the greatest ease; in others again, the adhesion is so strong that it is impossible to peel it off from its attachment. Instances are sometimes met with in which a portion of the placenta is so closely cemented to the uterine surface, that it cannot by any means be detached; nay, I have opened more than one body where a part was left adherent to the uterus, and where, on making a longitudinal section of the organs, and examining the cut edges, I could not determine the boundary line between the uterus and the placenta, so intimate an union had taken place between them;* the student may readily imagine, therefore, how difficult the removal of an adherent placenta will sometimes prove.

When called upon to separate an adherent placenta, we may find the uterus flabby and uncontracted, or it may have embraced the mass more or less tightly. It is most usual for a contracted state to exist in conjunction with morbid adhesion, because the probability is, that the organ will have made some abortive efforts to expel it, and not being able to protrude it from its cavity, will have closed upon it. We shall also sometimes meet with it partially extruded from the uterus, and a greater or less portion lying loose in the vagina, and we may trace it passing through the os uteri, and find another part adherent to the parietes within.† It is certainly true that this condition cannot happen, unless the attachment had been originally much lower than is usual, or unless the placenta be oval rather than round in form; but when it does occur, it may be the cause of much embarrassment, and, if not understood, of great danger. So long as any portion remains connected by morbid organisation with the uterine surface, so long any attempts to remove it by traction at the cord, or even by pulling at the placenta itself, must be in the highest degree hazardous; and for this reason I have, on a former occasion, inculcated the caution not to attempt its removal by the agency of the funis, until not only the insertion of the cord can be easily distinguished,—not only the bulk of the placenta can be clearly felt, but its general body can be completely surrounded by the finger, introduced as in a common examination. The management of the case I am supposing must be conducted on exactly the same principles as if the whole organ was shut up within the uterine cavity.

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* See Hamilton's Outlines, 1840, p. 168; my father's Practical Observations, part i. p. 75, first edition; p. 48 of the second; and Barlow's Essays, p. 250.

† See my father's Practical Observations, part i. p. 78, first edition; p. 49, second; and Ingleby, on Uterine Hæmorrhage, p. 200.

We may *suspect* that morbid adhesion exists, if after the birth of the child the placenta does not descend, although the uterus continues moderately active; and if, on putting the funis rather on the stretch, and then letting it suddenly go, it springs up with a sort of jerk: but we can only *positively* detect the true nature of the case when the hand is in the uterus for the purpose of taking it away.

Treatment.—The removal is to be conducted on exactly the same principles as I before advised. The hand is to be carried up to the placenta; we are to seek for an edge which has been separated, and is lying loose; insinuate the fingers cautiously between this and the uterine surface; and by gently moving the hand from side to side with a sawing kind of motion,—keeping the palm towards the placenta, and the knuckles next the uterus,—we continue the separation until we find that we have encompassed the whole of the organ, and that it drops loose into our hand: or if the adhesion be too firm to give way to this mode of proceeding, we may often succeed in removing the whole by separately picking the adherent portions off with the fingers and thumb.

Either of these methods is in my estimation far preferable to that recommended by Hamilton* and Burns†—expanding the hand over the fœtal surface, and squeezing the edges towards the centre; because, if the agglutination be firm, we are very likely to break the placenta, and leave some filaments still adherent. The principal, and indeed the only objection to the plan I adopt, is the chance of bruising, scratching, or slightly tearing the uterine membrane with the ends of the fingers, the nails, or the knuckles; and no doubt, if the nails be long, pointed, or rough, at their extremities, or the operation be performed hurriedly or inconsiderately, such accidents are very likely to happen; but I take it for granted that due caution will be used, and I am myself not aware of ever having inflicted injury under this operation.

The hand should not be withdrawn from the uterus until the entire separation is effected, and we must be most particular in removing every particle of the mass. I know that to get it all away is sometimes impracticable, owing to the strength of the cohesion: but such cases are fortunately rare. I know, also, we are told by some authorities of great weight, that should the placenta break under the action of the hand, we are not to use much effort to procure it all, but remove what we can, and leave the remainder.‡ I cannot help thinking that such a doctrine is highly dangerous, by impressing the student with the belief that *in many cases its entire separation is impossible*, and perhaps by lulling him into a fatal carelessness. It would be my wish, on the contrary, to inculcate the idea that the *whole* can very generally, and ought, even at the expense of some trouble, to be removed; and that we should never feel satisfied we have done our duty, unless we have used our best endeavours to effect its entire abstraction. The recommendation given by those practitioners who think differently with myself, is founded on the supposition that more danger would accrue by our attempts at separating the strongly-adherent portions, than by leaving a part behind. From some practical observation, however, I am persuaded that very few states after delivery are fraught with such extreme peril as that in which any portion of the placenta remains adherent to the uterine surface; and I believe, also, both that the uterine membrane is not so liable to serious injury as has been supposed, and that, if injured, it possesses great powers of reparation within itself: and for these reasons I consider it my duty strongly to enforce the practice I have just ventured to advocate. On examining the placenta, too, after its removal, if a large portion be wanting, I think it better to introduce the hand a second time immediately, for the purpose of taking the disrupted piece away, —than to leave it to be expelled, to putrefy, or to the chance of its absorption.

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* Op. cit. p. 171.

† Op. cit. p. 363.

‡ Blundell, Obstet., p. 628; Burns, Princ. of Mid., p. 363; Hamilton, Pract. Obs., pp. 171 and 175; Davis, Obst. Med., parag. 1063.

I have recommended, for the reasons assigned when treating of transverse presentations, that the left hand should be employed in operating within the uterus rather than the right: other practitioners of experience prefer the right, with Hamilton[*] and Merriman;[†] and others, again, as Ingleby,[‡] introduce the right if the placenta be attached towards the back part of the organ, and the left, if forward; and they judge of the situation of the mass by the direction in which the funis runs upwards into the cavity. I am not satisfied that it is always, nor indeed generally, possible to tell whether the placenta be connected anteriorly or posteriorly, by tracing the funis up to the pelvic brim; and under every diversity of attachment, I am myself in the habit of using the left.

It cannot have escaped the observation of the reader, that the difficulty in removing an adherent placenta will be dependent upon two causes; partly the contracted state of the uterus in resisting the introduction of the hand, but principally the degree of its adhesion, both in extent and intensity; so that we have a combination of difficulties, only to be overcome by the most judicious management, and not to be undertaken except by one who has acquired an intimate acquaintance with the structure of the organs.

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[*] Pract. Obs. p. 170.

[†] Synopsis, p. 147.

[‡] On Uterine Hæmorrhage, p. 185.

Although, when the hæmorrhage is copious, the manual removal of the placenta is the only means to which we can trust for the closure of the uterine cavity, and the suppression of the discharge, still, if the patient be lying under a state of syncope, it would be improper to empty the uterus until the system has somewhat rallied, lest it be left in a flaccid condition, and on the restoration of the heart's action a fresh and more violent eruption should ensue; for it cannot be too strongly or too frequently impressed on the mind of the junior practitioner, that the removal of the placenta is not our only object, but that the chief part of our attention should be directed to producing a firm and permanent contraction in the uterus itself. Gooch, indeed, used to declare, "he could positively assert from experience, that the organ would contract even during syncope," but he acknowledged its action under such circumstances was feeble.* I do not mean to deny the possibility of contraction occurring under a temporary suspension of the vital functions; but I greatly fear that, in the generality of such cases, we should be disappointed in our expectation; and I am also convinced, that the safest plan is that I have just advised. The exhibition of stimuli, then, may become necessary to rouse the torpid energies before the operation is proceeded in.

A morbid union appears occasionally, though very seldom, to take place between the fœtal membranes and the uterine surface, at a greater or less distance from the point of placental attachment; and if such an adhesion exist to any considerable extent, it may prevent the occlusion of the placenta from the uterine cavity, and consequently be the cause of a retention of the mass.† We should not, *à priori*, suppose that agglutination, by the deposition of coagulable lymph, would occur between the uterine membrane and the chorion, from the great dissimilarity of their tissues; but I am persuaded I have known not a few instances in which such an adhesion impeded the descent of the placenta into the vagina; and others have been communicated to me on authority, to which I give implicit credit. The case must be treated, nearly in every respect, on the principles already laid down; the removal of the placenta under the circumstances would be easily effected; and the separation of the membranes from their connection with the uterus far from difficult.

It is a remark made by most practical men,‡ that some women seem constitutionally subject to an adhesion of the placenta; so that this cause of danger exists in almost every successive pregnancy; and I have myself known several examples of this unfortunate peculiarity. It becomes, then, a point of some importance to ascertain whether, by any means applied during gestation, the danger might be obviated. Quietude, rest, regular attention to the action of the bowels, an unstimulating diet, and the occasional abstraction of blood—particularly if the circulation be hurried, or a fixed pain show itself in the uterine region—seem to offer the best chance of success. With regard to bleeding under pregnancy, I am certainly averse from it, unless there exist some grave occasion; and as a principle, do not coincide with those practitioners who have frequent recourse to the lancet to prevent flooding in labour, where the uterus is constantly disposed to remain flaccid after the birth of the child: because in such patients the powers of life are generally weak, the habit is relaxed, and the system not in a condition to bear up against the effects of depletion. If blood be formed rapidly—as is sometimes the case under pregnancy—the lancet may be advantageously employed as a means of checking this constitutional hæmorrhage in labour: and if there be undue determination to any particular organ, bleeding is even more necessary than in the unimpregnated state; for it is a common observation, both that inflammatory disease runs on to its termination more speedily during gestation, and that the loss of more blood is required for its subdual, than in the ordinary condition of the system; and I think I have on some occasions seen the advantage of the abstraction of blood in preventing placental adhesion.

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* Compendium by Skinner, p. 175. This closing of the uterine cavity, however, under such circumstances, appears to me to be attributable rather to the elasticity of the uterine parenchyma before spoken of, than to active contractile efforts.

† See my father's 5th case, Pract. Obs. in Mid., 2nd edit. p. 63.

‡ Hamilton, Pract. Obs. p. 169. Rigby (Library of Med., vol. vi. p. 225) and others.

Disrupted placenta.—When a portion of the placenta is left in utero, the patient is generally harassed with violent afterpains returning at longer or shorter intervals, preventing sleep, and causing excessive irritability. By degrees the pain becomes more continual, and at last almost incessant, and it is much increased on pressure being applied over the hypogastric region, and on putting the infant to the breast. On the first burst of the eruption ceasing, the uterine discharge is usually moderate, with the expulsion of occasional coagula. In the course of two or three days it assumes a character far from natural: it becomes sanious, of a dark and dirty brown colour, putrescent, and necessarily highly offensive to the smell; and, together with the exuding fluid, small shreds of putrid placenta will sometimes pass. Shortly the system in general sympathises with the unhealthy state of the uterine organ; febrile symptoms, violent in degree, supervene, ushered in by one or more rigors; the pulse soon becomes rapid, and is generally small; there is heat and dryness of skin, more particularly on the abdomen; immoderate thirst;

great anxiety both of countenance and mind; restlessness, almost amounting to jactitation; frequent sighings; occasional vomiting, or a distressing sensation of choking, especially on attempting to take fluids, and perhaps also on pressure being applied to the uterine region; uninterrupted wakefulness; a diminution in the secretion of milk: the tongue is white, loaded, and slimy, or red, dry, and shining; and there is more or less headache, with wandering of the mind. Sometimes the pain in the head is of a pulsatory character, and constant; at others, of a sharp, darting kind, and intermitting. Another very common, indeed almost universal symptom, is erratic pains in different parts of the body, most usually darting from hip to hip, or situated in the region of the diaphragm, much impeding respiration, and varying in intensity as in situation. The bowels at first are more torpid than ordinary, but after a time they become much relaxed, and there is difficulty in checking their action. As the case proceeds, the dangerous symptoms progressively increase; the strength hourly diminishes; the belly swells, and becomes tense; low delirium supervenes; the tongue acquires the typhoid character; vomiting of dark coffee-ground-like matter occurs; the extremities become cold; the fæcal evacuations and urine are voided involuntarily; subsultus tendinum comes on; and the patient sinks within ten or twelve days after delivery.

Upon dissection the veins of the uterus are generally found inflamed, and containing pus; the uterus itself, to a greater or less extent, partakes in the inflammatory disposition, and is perhaps gangrenous; or purulent deposits are observed in its substance; and perhaps also in or around some of the larger joints, or among the tendons, or within the fleshy muscles of the limbs.

It is not always, however, that the disease runs this fatal course. Sometimes the putrid mass is thrown off from the uterus, and relief almost instantaneously follows: at others, the symptoms never assume such virulence of form; and on the third or fourth day from delivery, a purulent discharge, almost devoid of any unpleasant smell, flows from the vagina, in which filaments of the placenta are discernible, and which often lasts for two or three weeks. I suspect this discharge to be a secretion from the inner surface of the uterus, consequent on inflammation, and to be a means adopted by Nature to get rid of the offending body, and always hail its appearance as one of the best signs we can observe. I seldom saw it afforded in such quantity as materially to depress the vital powers, and still less frequently have I known death ensue where it had been freely formed.*

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* "In rare and mild cases [of disrupted placenta] a puriform discharge has escaped from the vagina." Ingleby, p. 212.

Treatment.—When the hæmorrhage has ceased, which must be met by such means as have more than once been insisted on, our treatment must entirely depend on the urgency of the symptoms present. The bowels must be moderately opened in the first instance, and their action restrained afterwards, if inordinate; the irritability of the stomach may perhaps be allayed by effervescent draughts; and sedative medicines, either opium itself, or those of a milder kind, will generally be found useful. There exists a little difference of opinion among practical men as to the propriety of removing the after-pains by opiate remedies. My father* and Blundell† think it better not to interfere with the uterine contractions, because through their agency it is probable the irritating mass may be expelled. On the contrary, others, as Ingleby,‡ regard opium as called for. For myself, considering the distress these pains produce, I think it better to alleviate them, more especially as they frequently fail in producing the good anticipated, and as by their severity they may occasion excessive irritability. Bleeding from the arm will seldom be borne with impunity; but more relief may be obtained by the application of leeches to the hypogastric region. I have occasionally found benefit from counter-irritants applied to the side of the chest, or that part where the sympathetic pain was most acute; but not so frequently as I could have desired. As these pains, indeed, are usually erratic, and dependent (as I presume) on the unhealthy condition of the uterine membrane, it is reasonable to suppose that more advantage will be derived from local applications to the uterus or its neighbourhood, than to the immediate seat of painful sensation. Under this idea I have generally directed my attention to the uterus, and my means to overcoming the disease existing in its structure: next to leeches, then, I have thought relief has been obtained from external fomentations, and particularly injections of warm water into the vagina or cavity of the uterus itself. If the os uteri be not morbidly tender, the nozzle of a properly-contrived syringe may be passed just within the orifice; but if this attempt should give much pain, the vagina may be washed out every two or three hours. The application soothes the parts, by acting as an internal fomentation, cleanses them of any putrid fluid which may be lodging within them, and may, perhaps, even tend to separate the adherent portions of placenta, and bring them away. A weak solution of the chloride of lime or soda may be substituted for the plain water, sometimes with advantage. When the symptoms of excitement have merged into those of depressed powers, wine, ether, ammonia, bark, and aromatics, may be used; but their efficacy in restoring the system to a healthy state is, at the best, inconsiderable.

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* Pract. Obs. part i. p. 167, first edition, p. 95 of the second.

† Obs. by Castle, p. 612.

‡ On Uter. Hæm. p. 221.

ACCIDENTS LIKELY TO HAPPEN ON ATTEMPTS TO REMOVE THE PLACENTA FROM THE UTERUS, BY PULLING AT THE FUNIS.—The cautions to which the student's mind has been directed, regarding the necessity of waiting until the placenta is wholly lodged in the vagina, before any attempt is made to withdraw it by the funis, are not without their object: for if the mass be adherent, we shall either separate it further from its attachment; or we shall break it, leaving a part in utero; or we shall rupture the funis, or cause it with the membranes to slip away from the bed of the placenta; or, lastly, we shall invert the uterus itself. Of these accidents, breaking the funis is the least, inverting the uterus the most dangerous, in its consequences. If we break the funis, we certainly lose it as a guide to the placenta: but this is not of much importance. We can pass the hand into the uterus, and remove the placenta,—should such practice be necessary,—when the funis is broken off, almost as well as when it is entire, and its value as a guide is on the whole but trifling. If, by our improper interference, we separate a larger portion of the placenta, we shall bring on an increase of hæmorrhage, which will probably require the instant withdrawal of the mass. If we extract only a part, leaving a large portion behind, we shall also require to introduce the hand for the purpose of removing the remainder. But it is possible that we may even invert the uterus: for if the placenta be adherent to the fundus of the organ,—if the adhesion be strong,—if the funis does not give way to the force applied to it,—and if the uterus be flaccid, and have not contracted round the mass,—the fundus may descend, pass through the os uteri into the vagina, and the viscus will be turned inside outwards, as a pocket might be.

Whenever this serious accident has happened (which may *generally* be looked upon as the consequence of improper treatment, although it may certainly occur spontaneously, and without any force having been applied to the funis;*) it may be known by the placenta still remaining adherent, though perhaps external to the vulva; by the sudden appearance of the sensitive tumour which occupies the vagina; and by the womb not being discernible above the pubes by the hand applied over the abdominal parietes. Symptoms also immediately appear such as attend upon an aggravated nervous shock; there is severe forcing pain, a quick pulse, laboured respiration, cold extremities, a cold sweat on the brow and neck, vomiting probably, and a sense of suffocation and great anxiety. The organ must be restored to its natural position as soon as can possibly be effected; for the lapse of every minute will be of consequence, since the longer we delay, the more difficulty shall we experience in its reduction. For this purpose, the hand being half-shut, the backs of the fingers are to be pressed firmly against the most depending point of the tumour; when the part will yield, the fundus will pass up with a sort of jerk, the organ will be restored to its natural situation, and the hand will occupy the cavity. The placenta may now be removed, as before recommended; and, on the hand being withdrawn, the greatest care must be taken that the inversion—of which there is some probability—does not occur again. Unless this restoration be effected within a short period of the time after the accident took place, I should presume either that it could not be accomplished at all, or that there must be alarming hæmorrhage in proportion as the flaccidity of the uterus rendered its reduction easy.

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* Ruysch, Obs. Anat. Chirurg. Obs. x. p. 13, who states that this very occurrence happened to himself "tempore, quo opem ferebam parturientibus." Denman, chap. xv. sect. 12. Waller, in a note in his edition of Denman, p. 421. Merriman, ed. 1820, p. 149. Radford, Essays on various subjects connected with Midwifery; also in Dublin Journ. of Med. Science, 1837, vol. xii. pp. 25—215. Rigby, Library of Med. vol. vi. p. 219; all agree that spontaneous inversion may occur. See also a paper and case in Med. Gazette, April 5, 1844, by Mr. Barker; and a case in the Lancet, vol. ii. p. 406, by Mr. Clarkson. I was myself called, on Feb. 18, 1844, to a case of inversion, which occurred under the hands of one of the most careful of our midwives in the Royal Maternity Charity, in which I was assured that not the least effort had been made to extract the placenta. The patient was dying when I arrived, about an hour after the occurrence, although there had been very little hæmorrhage. She seemed to sink from the shock communicated to the system in consequence of

Many practitioners* recommend that the placenta should be separated from its attachment before any attempt is made to replace the uterus. I should myself much prefer acting as just advised, because, should the detachment be effected while the organ remains in its inverted state, either the woman must lose a great quantity of blood from the patulous orifices of the exposed vessels; or, if such a degree of contraction took place as to stop the hæmorrhage, that very shrinking of the uterine parietes would preclude the possibility of restoring it to its natural position.† It is most probable that powerful stimulants will be

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the accident. The uterus was very flaccid; I restored it without difficulty to its natural position; but the woman expired before I left the house. In the New England Quarterly Journ. of Med. and Surg. No. 1, p. 141, there is a case detailed, in which the uterus inverted itself without any traction being applied to the cord, under the care of Dr. Storer, of Boston.

* Puzos, Traité des Accouch. 4to. 1759, p. 250; Davis, p. 1088; Velpeau, p. 521; &c.; Burns, p. 501, and Dewees, parag. 1309, recommend the uterus to be restored before removing the placenta. Denman, chap. xv. sect. 12, and Blundell, p. 693, that if the placenta be detached to a considerable extent, it should be separated first; if it be entirely adherent, it should be returned with the uterus, and removed afterwards.

† Besides that mentioned in the former note, three other cases of inverted uterus have come under my observation. In one I was requested to be present at the inspection of the body of a woman who had died from flooding soon after delivery; we found the uterus completely inverted, and lying in the vagina. The attendant, an unqualified practitioner, had separated the placenta after the accident, and had

required to sustain the patient's vital powers under the aggravated shock which the nervous system has encountered.

Errors liable to be committed.—The errors, then, that the

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contented himself with hiding the organ from sight within the external parts. The second was some months after delivery. The uterus was contracted to its small unimpregnated size,—almost as well, indeed, as though it was *in situ;* but the patient was draining to death with a copious fœtid discharge. I proposed its removal by ligature; but my suggestion was not acceded to. I never heard of her afterwards. The last patient I saw about twelve hours after the accident had happened, on July 20th, 1839. She was a young person of exceedingly cachectic habit, and of very relaxed fibre and it was her first labour.

I was informed by her mother that while traction was being made at the funis, as the placenta descended, she suffered a sudden and agonising pain, which had continued ever since, more or less, with much forcing. When I saw her she had not passed any urine since her delivery, had lost a large quantity of blood, and was greatly depressed. I found a tumour occupying the vagina as large as a man's closed fist, covered throughout its whole surface with a layer of coagulum. It was sensitive, but not painfully so, possessed a doughy feel, and became harder when compression was applied. At the same time no uterus could be felt above the pubes; but in the situation which it ought to have occupied there was a sensation of a most unusual void or want. She was faint and pallid, with a quick, feeble pulse, and much cold perspiration. I relieved the bladder by the catheter; and, as I had no doubt the tumour was the uterus inverted, I made some strenuous efforts to restore it, without effect; but not without putting her to considerable pain. After some time I desisted in despair, fearing I should lacerate the upper part of the vagina, since the tumour had become very hard whilst I was making these efforts; and in the same proportion the circle of the mouth became closed around it in the form of a forcibly constricting ring. I, therefore, contented myself with putting her under the influence of morphia. Next morning she had slept four or five hours, had passed water, at which time nearly half a pound of firm coagula came away, and was still in pain, though it was much moderated. She was confined to her bed wholly for two months, and to the house for three, with copious irregular hæmorrhages and severe lumbar pains. About the middle of October she was able to take a drive occasionally, the floodings having ceased; but the bearing-down pains, attended by a profuse glairy, leucorrhœal discharge, still persisted. Towards the end of December, she was again attacked with flooding to a frightful degree; and on its moderating, in two months, she was removed a short distance from London. I did not see her again till May 22nd, when I found her health generally rather improved, although the hæmorrhage and leucorrhœa had annoyed her almost incessantly throughout the spring. On June 5th, 1840, nearly eleven months from the time of her labour, with the assistance of Mr. Hamilton, of the London Hospital, and Mr. Farrants, the then attending apothecary, by means of the double polypus canula, I placed a ligature around the upper part of the tumour, then about the size of a small nonpareil apple, intending to allow it to remain until the uterus sloughed away. The application gave but little pain at the moment, and the bleeding which had been going on almost uninterruptedly, ceased immediately. In an hour, however, she began to complain of excessive suffering; and on the next day there was every symptom of violent peritoneal inflammation, ushered in by a rigor that came on three or four hours after the operation. The distress was so great, and the danger appeared so urgent, that it was thought right to remove the ligature, which was done twenty-four hours after it was applied. The pain and other inflammatory symptoms gradually subsided; in a few days she was able to leave her room; she menstruated on July 13th; the discharge lasted only three days, and was not nearly so profuse as she had formerly been accustomed to, at each catamenial period. She continued to menstruate moderately every month, without pain or the expulsion of coagula; and the leucorrhœa which had always distressed her from the commencement of her menstruating life, entirely ceased. She regained her flesh, colour, and appetite, was able to take a long walk; had no bearing-down nor any difficulty in passing water; she could move about and sit without inconvenience; her bowels were regular; and when I saw inexperienced practitioner is liable to commit in a case of adherent placenta, are many. He may pull too violently at the cord, and cause rupture of the placenta, rupture of the cord, or inversion

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her in January, 1841, she told me that she enjoyed better health than she had done for many years. *Nothing solid had ever passed from the vagina since the operation.* Very early in this year *symptoms of pregnancy manifested themselves;* and I attended her of a six months' fœtus on the 7th of July, in the same year, 1841. Since then I have attended her, also, with four other children. On one occasion, the placenta adhered, and I had to introduce my hand into the uterus to remove it. I took the opportunity of examining whether there was a polypus in the cavity; but could detect nothing like one. On another occasion, after the placenta had been expelled naturally, she was harassed with violent, spasmodic, bearing-down pains, without hæmorrhage, which induced me to pass my hand into the uterus; I then found the internal surface very irregular, undulating, as it were; and the fundus and posterior part of the body protruded considerably downwards and forwards, there existing evidently a disposition for inversion to occur again; this, however, was obviated by the introduction of the hand.

This case for years puzzled me more than any I ever attended. I did not think it within the range of possibility that the uterus could restore itself spontaneously, after having been inverted for more than a year, and after having been surrounded by a ligature for twenty-four hours, which had occasioned such severe peritoneal inflammation, as to require its removal, to save the patient's life. Yet I never had the least doubt that the case was as I have described it to be. Every occurrence, and every symptom indicated that inversion had really taken place, and my two friends engaged with me fully concurred in the diagnosis. The supervention of pregnancy proved its natural restoration. We have now sufficient evidence before us, that this is by no means a solitary case of the kind; but that in a few instances *the inverted womb has righted itself spontaneously, many months after the accident had occurred.* Dr. Meigs (Treatise on Obstetrics, p. 607) gives a case of inverted uterus, of two years standing, which he himself saw, as well as Dr. Hodge, Professor of Obstetrics in the University of Pennsylvania—than whom a more experienced or more skilful practitioner does not exist—and Dr. Warrington, also, where a spontaneous restoration took place; as was proved by the patient becoming subsequently pregnant. Another which he attended with Dr. Lewis, where pregnancy occurred after the womb had been inverted many months; and another in a letter from Dr. Hatch of Kent, Connecticut, seen by him, Professor Beers, Dr. St. John, and Dr. Beardsley, where eighteen months after the accident menstruation recurred twice, and pregnancy took place ten months subsequently. None of these gentlemen had any doubt that the cases they had under their care were really chronic instances of inverted uterus, spontaneously restored; nor indeed from the accounts published, have I myself. Boivin and Dugès, on diseases of the uterus, say:—"It is very remarkable that this cure is sometimes effected spontaneously, even after a long continuance of the disease." (Heming's Transl., p. 123.) And Dailliez (Précis des Leçons de Baudelocque, sur le renversement de la Matrice, Paris, 1803, p. 35,) gives two cases seen by Baudelocque, and one by Leroux, in which chronic inversion of some standing was spontaneously reduced; so that we cannot doubt the fact of its having occasionally happened. I do not publish my own case, nor quote the others, with the intention of recommending that an inverted uterus should be left unaided in the hope or expectation of the organ being replaced by nature, after the ailment has become chronic; because no man would do his duty, who did not use his utmost endeavours to return it to its original position, while the occurrence was still recent; but to show how wonderful the resources of nature are; how powerful is the "law of life, the *generic* law;" and to inculcate the doctrine that we should not despair in a case of this kind, however unpromising the result may appear. "The inverted uterus has been restored by surgical means in a number of instances, at a distance of several days from the occurrence of the accident. Mr. Cawley reduced it after it had been down seven days (Lond. Med. Journ. vol. vi., p. 366). In other cases, Radford reduced it after seven, and Ingleby after eight days; and Belcombe succeeded, though the inversion had existed twelve weeks." (Simpson, Obst. Mem., vol. i., p. 820.) In such cases the replacement would be much facilitated, of the uterus. He may be too fond of removing the placenta by the introduction of the hand soon after the birth of the child. He may also—but of this there is less danger—delay extracting it until it be too late, when the patient having fainted frequently, lies gasping and tossing about, and is cold in the limbs, and a cold sweat breaks out on the upper part of her person. He may use too much force in introducing the hand, and bruise the vagina or uterus, and too little care in separating the placenta, leaving a greater or less portion behind. He may suppose, because he can feel part of the placenta, that therefore it must be entirely in the vagina; and he may endeavour to remove it by pulling at the mass; he may therefore break it, withdraw half, and allow the other to remain in the uterus, and by its putrefaction to become the occasion of that train of distressing and highly dangerous symptoms which I have just enumerated; or, lastly, he may not pay sufficient attention to the necessity of procuring a thoroughly contracted state of the uterus; he may take away the placenta, and leave that organ in a flaccid condition, the cause of a persistence of the bleeding.

HÆMORRHAGE SUBSEQUENT TO THE REMOVAL OF THE PLACENTA.—Even after the placenta has been expelled naturally,—or more frequently after it has been extracted by the hand, in consequence of atony of the uterine fibres,—(notwithstanding that the labour is said to be terminated so far as the different stages are concerned)—the woman is liable to a continuance of the hæmorrhage, or to a fresh eruption, owing to the want of due contraction in the uterine parietes.

Causes.—We shall generally find that this description of case occurs to women of a relaxed habit, and weak muscular fibre—to those who have borne a great many children, or after a lingering or instrumental labour; or in cases where the child's body has been hurriedly extracted after the head is born. Exactly the same causes, indeed, will produce this state, as would occasion that inertia of which the retention of the placenta itself is the consequence.

Frequently, under these circumstances, the blood escapes externally; at other times it is retained in the uterus. A coagulum forms at the os uteri, and the effect of this plug is obvious; the blood is poured out from the open vessels into the uterine cavity, is prevented flowing forth, but continues accumulating within, sometimes to an amazing extent. The danger, as before remarked, is even greater than when the hæmorrhage is external,

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probably, by the use of anæsthetics; as seems, indeed, demonstrated by a case reported in the Med. Times and Gazette, September 18, 1852, p. 286, where an inverted uterus of *five months* standing was restored by Mr. Canney, the patient having been placed under the influence of chloroform; and another in which Valentine reduced it, *sixteen months and a half* after the accident, by the aid of ether (Rev. Med. Chirurg. Nov^{bre}., 1847).

both because the case may be overlooked, and because the more the uterus is distended,—the more blood the cavity contains,—the larger do the vessels become, dilating in their calibre in proportion as the womb increases in extent and magnitude. The organ has been known to acquire a size, after the birth of the child and extraction of the placenta, almost as large as it was previously to the commencement of labour, so that its fundus rises above the umbilicus, while its cavity contains many pints of blood. Notwithstanding this internal accumulation, scarcely a stain, perhaps, appears externally.

Sometimes the uterus contracts tolerably well immediately after delivery, and then again relaxes, contractions alternating with relaxations, until a very considerable quantity of blood having been lost, the patient sinks. It is on this account that I have more than once recommended that the uterine tumour should be examined, by the hand applied over the abdomen, three or four times within the first hour after delivery; and that the patient should not be left until the attendant is satisfied of the perfect and permanent contraction of the organ.

Still another sort of case occurs, which we should scarcely expect,—a dangerous degree of hæmorrhage, notwithstanding that the uterus is acting powerfully, as evinced by violent after-pains. We lay it down as a principle,—true enough in general,—that the more strongly the womb contracts after delivery, the less danger is there of bleeding; but this proposition only applies to cases where the cavity is empty. If it contain a portion of the placenta, a considerable part of the fœtal membranes, or any other substance, its fibres may act preternaturally strongly, to expel the offending body; and yet, as the cavity is not perfectly closed, hæmorrhage may go on from the uncontracted vessels. Now, occasionally the coagula which collect within the womb acquire such a degree of tenacity, that they adhere to the internal membrane almost as firmly as the placenta itself under morbid agglutination; and there is nearly the same improbability of their natural expulsion. Under such circumstances, the manual removal of the fibrinous mass, provided it can be accomplished without injury, offers the best chance of safety.* Whenever, indeed, the patient complains of distressing after-pains, coming on every three or four minutes, accompanied by a sanguineous draining, to such a degree as to give occasion for well-grounded anxiety, it would be right to pass the hand with gentleness into the uterus, and to remove whatever may be contained within it.

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* It has happened to me to meet with many cases of this kind, in which, although the uterus was small and tolerably firm, a draining of blood to an alarming extent was going on, while the patient was harassed with almost insufferable after-pains. On the introduction of the hand more or less entirely within the uterus, and the removal of the clots, not only has the discharge ceased, but the painful contractions have also disappeared; and almost instantaneous security, as well as ease, has been afforded. In some of these cases the dislodgment of the compressed coagulum, and its separation from the uterine surface, has not been effected without some trouble. I would refer the reader to a series of cases, which I published on this subject, fourteen in number, in the Medical Times and Gazette for March 26th, 1853, p. 316, and April 9th, p. 365.

Of all these three states, that in which the uterus enlarges rapidly, fills with blood, and shows no disposition to contract, is by far the most dangerous.

Symptoms.—We know that hæmorrhage is going on, by the common symptoms which indicate the loss of blood. The colour vanishes from the cheeks and lips; the pulse flags; fainting occurs; the breathing becomes laborious, and drawn with sighs; the extremities lose their warmth; jactitation ensues, and perhaps vomiting. Vomiting, indeed, is not an universal symptom of loss of blood, and seldom comes on until the system is much depressed. Under great exhaustion, I consider it a good sign, rather than a bad one: because it shows that the nervous system is not deadened, but that impressions are still kept up between parts remote from each other, by means of sympathy: and I think, also, that the very effort of vomiting tends to induce contraction in the uterus, and may thus be the means of preservation.

We know, too, that the woman is flooding,—if the discharge flows externally,—by an examination of the linen: sometimes we find a quantity of coagula expelled upon the napkins; at others, that part of the bed in which she lies is soaked with blood, and no misapprehension can arise as to the cause of the diminished vital energy. But the hæmorrhage may be internal and concealed;—still our means of diagnosis are easy and certain: the simple application of the hand over the uterine tumour will be sufficient to assure us of its state; and by the sensation it conveys, we judge whether blood is pent up within its cavity. If we find the organ large, soft, and flaccid; if it yield to the hand, and become harder when pressure is made upon it, and if then blood passes out of the vagina with a gurgling noise, we can be at no loss to declare the case one of concealed hæmorrhage. But, on the contrary, if the patient continue fainting, while there is no external flow—if we find the uterus as small as a fœtal head, and hard, and observe no relaxation in its structure—we must seek some other cause for the symptoms of depression, besides loss of blood:—the syncope is independent of hæmorrhage from the womb.

Treatment.—Under hæmorrhages after the expulsion of the placenta, our indication is to evacuate the uterus so as to insure the closure of its cavity; and, if necessary, to rouse the flagging powers by the judicious use of stimuli. Both outward applications, internal remedies, and manual operations, will assist us in the accomplishment of our purpose. Pressure and the employment of cold, will often of themselves prove sufficient to restrain the flow, and they may be used in combination.

Called, then, to a case of this description, the first means to be tried is the grasping pressure of the hand to the uterine tumour itself. It is not enough merely to lay the open palm upon the abdomen, and press steadily and flatly; but a squeezing or *kneading* action should be used upon its fundus and body, by which the organ is prevented filling and becoming distended with blood, while at the same time also its fibres are stimulated to contract. It is not unlikely that the patient may complain of the pain we are putting her to: she may be desirous that our hand should be removed. If the pain she suffers, however, be that of uterine contraction, her entreaties must be disregarded; because upon contraction alone her ultimate safety will depend. At other times she will not allow us to leave her for a single minute; she feels so much comfort from the pressure of the hand and from the support which the abdominal contents receive, and she experiences such a sensation of sinking when that pressure is removed, that she feels convinced she will faint if it be omitted. While hæmorrhage is going on with any activity, I place no reliance on a bandage, however tight it may be drawn, or with whatever local compression its action may be aided. I cannot think any folds of linen applied over the uterine region, nor anything in the shape of a tourniquet, as has been recommended,* can secure contraction in a manner at all to be compared to the grasping pressure of the hand.

We have proof, indeed, that even the pressure of the hand will not always produce the desired effect: but other means are in our power, efficacious and of easy application; and of these, cold may next be resorted to. A napkin soaked in vinegar and water, may be suddenly laid upon the hypogastric region, and the uterus will often answer the stimulus immediately. A succession of cold cloths may be used in this way, so as to keep the temperature of this part of the person below the standard, and steady pressure may be made alternately with this application. Should the bleeding, however, still continue, and the faintness increase rather than diminish, the means I next adopt (and sometimes this is much more useful than any other mode of applying cold) is dashing a quantity of water upon the lower part of the denuded abdomen. This may, perhaps, appear a rough and neither a very refined nor very delicate mode of treatment; but the case is of a highly dangerous character, and no consideration must interfere with our adopting the most efficacious means for insuring the patient's safety. It is an universal observation, that a comparatively slight degree of cold, applied suddenly and with a shock, will produce a greater effect than a more intense one continued for some time. Thus Gooch* gives us an instance in which the uterus was stimulated to contract by a quantity of salt and water, of the temperature of the chamber, thrown suddenly from an ewer on the abdomen, although it had not answered to the application of ice, which had been used previously for a considerable period.

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* See two papers by Mr. Pretty, in Med. Gazette, June 25, 1841; and Dec. 23, 1842.

We may, however, still be foiled, and must resort to other measures. The introduction of the hand into the uterine cavity may next be put in practice, and it seldom fails in producing the contraction we desire. The student may be inclined to inquire, then, why we should not introduce the hand immediately the hæmorrhage becomes alarming?—Because it is better first to adopt less severe measures. The introduction of the hand is always to be avoided, if, by any other method, we can produce the same amount of good, without the chance of injury: but yet there are many states that fully warrant even this proceeding. The coat must be taken off, the left hand and arm greased, and the hand being passed gently into the uterus, the parietes may be stimulated by the fingers moved within it; at the same time that the right hand grasps it externally; or, as Gooch† recommends, the bleeding vessels may be compressed with the knuckles within, while the uterine tumour is pressed upon without; and by this combination of external and internal pressure, it is seldom that we shall not succeed in putting a stop to the discharge. If there be any fibrinous coagula adhering to the internal membrane, these must be removed as cautiously as we should separate the placenta.

Some cases, however, will not yield even to this mode of treatment, and other expedients are recommended—such as injecting a quantity of iced water, vinegar, or other astringents, into the uterus itself;‡ advantage may sometimes be derived from throwing a quantity of cold water into the uterus;§ but I should fear using strong astringents in the same way, lest inflammation of the uterine tissue, or of its veins, should be induced. Ice‖ has also sometimes been introduced into the vagina with advantage, either naked, or wrapped in linen or flannel; before being passed into the cavity it should be held in the hand until the corners are rounded off. Again: it has been recommended that we should stuff the vagina, or even the uterus, with cloths steeped in any astringents at hand.* To such an application, under such circumstances, I have already objected; because the blood is not preserved in the woman's vessels by filling either the vagina or the uterus with extraneous substances; it is escaping through their orifices, and collecting in the uterine cavity; and as the womb, by the presence of the plug, is prevented contracting, the very object which we wish to gain is defeated by our own anxious care. Compression of the aorta has lately been much extolled by Baudelocque the younger, who claims the credit of the suggestion.† There is not much difficulty in controlling the flow of blood through this vessel in most women after delivery, especially if they be of spare habit, owing to the lax state of the abdominal muscles; and in some cases of after-hæmorrhage, this proceeding may be attended with fortunate results.‡ Dr. Rigby § thinks the application of the child to the mother's breast the most efficacious means of procuring uterine contraction in this species of hæmorrhage. He grounds his opinion upon the sympathy which exists between the two organs, and the known fact of the action of sucking very generally inducing after-pains. If the trial can be made, without disturbing the patient much, I see no objection to its adoption.

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* Compendium, by Skinner, p. 168.

† Op. cit., p. 164.

‡ Saxtorph; "New Method of Treating Hæmorrhages after Labour." Pasta, in extreme cases, advises the injection of alcohol, or dilute sulphuric or nitric acid.—(Gardien, vol. iii. p. 230.)

§ I have seen some cases of dangerous hæmorrhage after delivery, that had resisted all other means, cease, on a quantity of cold water, to the amount of two or three pints, being pumped into the uterus by means of the patent enema syringe. The nozzle of the syringe must be introduced just within the os uteri. The water will, of course, not be retained within the uterus, but flow away. Dr. Young, in his lectures, used to recommend the injection to be repeated ten or twelve times. Most likely the syringe he used could only inject a small quantity at a time.

‖ Blundell, p. 466; Gooch, p. 167.

Of remedies acting through the agency of the stomach, stimuli (domestic or medicated), opium, the acids, and the ergot, are the chief in use. The cautions respecting the use of spirits, ammonia, and other substances which powerfully excite the arterial system, I need not here repeat. They are only admissible—as long as there is a chance of hæmorrhage continuing—when the powers are sunk so low that there is immediate and imminent danger present. I have stated that opium, in large doses, is very much extolled in cases of flooding, especially by Professor Burns and Dr. Stewart, but that I consider it a medicine inadmissible unless the uterus have entirely contracted, when the danger of fresh bleeding has gone by.* Opium certainly acts as a cordial, lulling the irritability of the patient, and producing sleep, or at any rate a composing stupor; but it also takes off both muscular and uterine action: it disables the uterus, therefore, from contracting, even were it so disposed: and if the proposition be true, that on the contraction of the uterus alone we are to rely for the patient's ultimate safety, it cannot but appear contradictory to resort to a medicine whose very action tends to prevent the effect desired. It has been objected, that although opium, in small quantities, takes away uterine action, yet, in large doses, it produces the very opposite result, and excites contraction. This proposition is at variance with common sense, with all analogy of the effect of other drugs, and at least with my experience. I have often seen, at the commencement of labour, uterine action suspended by what would be considered a large dose of opium; and if the same quantity will take away action at the beginning of the process, is it reasonable to suppose it will excite it at the termination?—But it may be said, the experience of practitioners of eminence proves the value of opium in the case under consideration; and that there is no reasoning against experience. I by no means deny that many patients have done well after the administration of large doses of opium; but that circumstance does not prove that the drug was the agent of their preservation. I should be inclined to attribute the recovery to other causes, independently of the exhibition of the medicine. I strongly recommend opium in large doses and the solid form, in those cases of irritability produced by a loss of blood which had previously taken place; but that only when the uterine cavity is closed, and the danger from flooding is past.

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* See Gooch, p. 168.

† Mem. de l'Académie des Sciences, January, 1835. Although this might have been an original thought of Baudelocque, the practice had been pursued ten years before by Ulsamer (See Lancet, July 20th, 1839): and I myself had employed it long before Baudelocque's memoir was published. A proposal to the same effect, by Trehan, will be found in vol. xxxiii. of the Journal Compl. de la Dict. des Sciences Med. p. 367.

‡ See a case by Mr. Brown, Med. Gazette, Dec. 2nd, 1842, p. 327.

§ Med. Gazette, vol. xiii. p. 785, and vol. xiv. p. 335. He gives cases in illustration; and states that his attention was first drawn to the subject by an observation in Professor Carus's *Gynäkologie.* See his opinion on this subject stated also, Library of Med. vol. vi. p. 217.

We should act unwisely to trust much to any of the mineral acids in these dangerous cases; but they may be resorted to in combination with other means: and they generally act as grateful refrigerants. The ergot seems to be indicated, as the grand object is to produce uterine contraction: it may be combined with an acid. I have witnessed many cases of after-hæmorrhage, in which its administration appeared to be attended with decided advantage.

Transfusion.—Our last resource is the transfusion of blood into the system of the dying patient,† a means deemed by some most powerful in arresting the vital spirit, even as it flutters with tremulous delay upon the lip. To Dr. Blundell is due the merit of having restored the practice, of advocating its adoption with all the force of his powerful mind, and proving its efficacy both by reasoning and experiment. But transfusion can be of little use, unless contraction has taken place in the uterine parietes. It is evident that, while the vessels remain patulous, the more we excite the arterial system, the more likely is the flooding to continue, as is demonstrated in the use of the ordinary stimulants. If, then, by infusing blood while the uterine structure remains flaccid, we cause the heart to beat more forcibly, the fluid will again exude through the open vessels; and we might inject *ad infinitum*,—the arteries emptying themselves as the veins become distended. But the case is very different when we have closed the vessels through which the blood escapes; it is then retained in the body, forms a part of the circulating current, revives the patient by its action on the brain, and restores her from temporary death to life. I would restrict the practice of transfusion, then, to those cases in which there is no chance of the blood again escaping;* and I think it would be most useful when the placenta has been removed—when the uterus has contracted—when the hæmorrhage that had caused the depression has ceased—but when the patient remains fainting, and in great danger, unable to be roused by stimuli taken into the stomach, and without a legitimate hope of restoration being effected by her own proper powers.

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* Page 411.

† For some account of the history of transfusion, see Appendix K.

In such cases, transfusion may be most valuable; but if it becomes a common practice, I am persuaded it will often be employed unnecessarily. This opinion I form from having seen many women recover without any blood being transfused into their system, who seemed scarcely to have a chance of life. If in these cases the means under consideration had been used, the credit of the recovery would have been given to the operation, and strong arguments might have been adduced in favour of the propriety of the measure.†

It is astonishing how tenacious of life some systems appear under uterine hæmorrhage, and how easily others will let it glide away. The necessity, then, of such means in any particular case, will be a question of the greatest nicety. If employed while hæmorrhage is going on actively, it will be useless; if delayed until the breathing has quite ceased, we cannot expect it will be followed by restoration; if commonly practised, it will many times be resorted to unnecessarily.

Mode of performing transfusion.—Blundell,‡ with much ingenuity, has contrived an instrument, named by him *the impellor*, by which the blood may be at once transfused from one system to the other, without being obliged to stagnate in a vessel; but as this is rather a cumbrous machine, and difficult to adjust, and especially as the same enlightened physiologist has proved beyond dispute that the vital fluid loses little or none of its valuable properties by being collected in a cup, absorbed by a syringe, and afterwards injected,—provided no time be unnecessarily wasted, —I shall merely describe the readiest mode of performing the operation by a common syringe. The instrument should be of brass, tinned inside, capable of containing between two and three ounces, perfectly air-tight, and free from oil.* One or two persons,—males in preference to females, from their less liability to faint,—being in readiness to supply the blood, one of the patient's veins at the bend of the elbow must be laid bare to the extent of an inch, and divested of its cellular web; an aperture must then be made into it of rather more than a line in length. The blood must be drawn from one of the bystanders in a full stream; about three ounces must be received into a conical cup or tumbler, and absorbed as soon as it is collected: the nozzle of the syringe must be raised perpendicularly, and the piston slowly propelled upwards, to expel any air that might have passed into the instrument: its point must afterwards be inserted into the aperture formed in the vein, and the blood slowly propelled towards the heart. No ligature need be put upon the patient's arm below the wound; but the vein may be secured by passing a blunt-pointed probe under it, having dissected it for the admission of the instrument, away from its surrounding attachments; and this particularly, lest blood should escape from the incision, and embarrass the operator. The chief delicacy of the operation consists in regulating the quantity used, and in adjusting the velocity with which it is injected to the diminished power of the arterial system. If we throw it in with too much force, we may choke the heart, and death will be the consequence: if, on the other hand, we are too tardy in our operations, the blood may partially coagulate, and be rendered unfit for the purposes of life. We may inject a second, third, and fourth syringe-full, deliberately watching, between each, the effect produced. Twelve or fourteen ounces will most probably, at the highest average, be sufficient, if any advantage is to result from our endeavours: for, since we know that, although a patient will sometimes bear to lose a large quantity of blood with comparative impunity, the additional loss of a very few ounces more may irrecoverably depress her, so we may reasonably infer that a small quantity added to the system, after a great diminution has been sustained, will be sufficient to raise it to the necessary point;—unless, indeed, the nervous energy be too much sunk to be roused by any means that human ingenuity could devise.

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* An exception should be made in favour of placental presentations, as mentioned at p. 411.

† See Hamilton, p. 339; Davis, p. 1066; and Velpeau, edit. Brux. p. 494.

‡ Physiol. and Patholog. Researches, 1824.

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* A very simple and ingeniously contrived syringe for the purpose of this operation will be found described and depicted in Waller's edition of Denman; also in the Lancet for Oct. 31, 1840, where there is a highly valuable case, and some judicious remarks by Mr. Lane. I have not thought it necessary to give a delineation of this instrument, nor to point out the mode of using it, as that copy of Denman is well known, and as I presume the talented periodical I have referred to is in the hands of, or at least accessible to, every practitioner.

I have directed, that if *transfusion* appear necessary, human blood should be used for the purpose; and this recommendation is founded on experiments first, in modern times, performed by Dr. Leacock, of Barbadoes, and made known through the medium of his inaugural thesis, printed in Edinburgh in 1817; and afterwards frequently repeated and varied by Dr. Blundell.* These experiments prove that the blood of one genus of animals is unfit to carry on the functions of life, when injected in any considerable quantity, into the system of an individual of another genus. If human blood, or that of the sheep, for instance, be injected into the veins of a dog, after the animal has been bled to syncope, resuscitation for a time occurs; but it is not lasting—the powers soon begin to droop, and after a period, varying from a few minutes to some hours or days of languid existence, death takes place. Thus, then, we must never think of employing, for the purpose in question, any other blood than that derived from the human subject.

Management of a patient after dangerous hæmorrhage.—When a woman has suffered hæmorrhage to any dangerous extent, although the uterus may have become firmly contracted, and, to her own feelings, she is comparatively comfortable, yet she must by no means be considered safe for many hours; because the organ may again relax, and with a return of the relaxation there may be a return of the bleeding. It behoves us, then, to guard against such a possibility; and the best mode of prevention is to keep her perfectly quiet, to allay irritability, and solicit sleep by a moderately large dose of opium, and to sustain her by a frequent supply of fluid nourishment in small quantities. Strict injunctions must consequently be given that she should not be moved for many hours. In ordinary cases, after labour we require that an hour and a half, or two hours, should elapse before the patient is placed in bed in the position she is to retain, and her linen changed; but after hæmorrhage, we shall frequently find it necessary to keep her in the same position for eight, ten, or twelve hours, or even longer. A bandage may be applied, but beyond that no alteration should be made in her person. Many cases are on record, where a patient, having suffered hæmorrhage, has been placed in a sitting posture, for the purpose of having her person made more comfortable, and has fallen down dead upon the bed;* others, where moving from one side of the bed to the other has produced syncope, and even death; and some, where the same fatal consequence has followed the slight exertion of raising the head above the level of the shoulders: so that we cannot be too cautious in allowing the least disturbance. The room must be darkened and kept well ventilated; opium may be given, with a little stimuli, if necessary; and such nutrient fluids as are most easy of digestion should be exhibited at regular and short intervals.

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* Op. cit. p. 81, *et seq.* Leacock, in his experiments on the dog, used sheep's blood; Blundell that of the human subject. In the Journal de Pharmacie for May, 1842, there is an account by Dr. Bliedin of a man æt. thirty-eight, who had five ounces of blood drawn from the jugular vein of a goat, injected into a vein in his arm, in consequence of a violent attack of hæmoptysis. He immediately complained of a feeling of oppression; this soon went off, and phlebitis supervened. He got well, however, and was able to resume his usual occupations at the end of three months. This case proves that injecting the blood of some of the lower animals into the human system is not *necessarily* fatal; but the amount here used must be considered small.

EFFECTS OF THE LOSS OF BLOOD.—There are many distressing symptoms consequent on the loss of blood, independently of fainting. Some of these appear soon, and are comparatively evanescent; others do not occur for some time, being more remote, but more permanent. Of the latter kind are cachexia, wasting, purgings, dyspepsia, dropsies,—especially an œdematous state of the legs and feet. Such affections are to be attributed to the balance of the circulation being destroyed, by the sudden abstraction of so much blood from the circulating system.

The loss of blood will sometimes excite dormant morbid actions, which may terminate in organic disease, where there is a predisposition to its formation. I have seen two cases in which phthisis itself seemed to be called forth, in its direst form, as a consequence of violent uterine hæmorrhage, no symptoms of diseased lungs having previously existed.

The loss of tone in the system generally, is best relieved by sending the patient into the country, to the sea-side, or some chalybeate spring, enjoining regular hours, regular exercise, regular nourishing diet, with gentle stimuli and tonic medicines,—provided there be no local affections, nor any contra-indicating symptoms. Œdema of the legs will most likely disappear spontaneously; if an accumulation of water take place in the abdominal cavity, diuretics or elaterium may procure its removal, or an operation may be required. The purgings produced by an irritable state of the mucous membrane, so frequent as a consequence of a copious loss of blood, may be relieved by chalk, hæmatoxylon, and other astringents, opium, rice, and a nourishing diet. The aphthous state of the mouth accompanying the purgings will also often yield to the same treatment. Both these symptoms, however, are most likely to be alleviated by sending the woman into a purer air. It is commonly observed by practitioners in crowded cities, that the diarrhœa has subsided immediately on removal, although it had not given way in the least degree to the exhibition of the most approved medicines.

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* Meigs (p. 346) reports of a patient of his own, whom he had left "as well as could be desired;" but before he had reached home, he was recalled, and found she had been allowed to sit up in bed for the purpose of passing water:—she fainted while being held in the nurse's arms; and it was found that the chamber-pot was half full of blood. She was nearly dead when he arrived, and her convalescence was long and severely protracted.

Re-action after flooding.—The symptoms which appear immediately after flooding, when the first effects of fainting are gone off, are those of re-action and nervous irritability in an extreme degree. When the system is deprived of a large quantity of blood, the circulation is carried on in a much more rapid manner, that the increased velocity may compensate for the diminution in quantity; and in proportion as the quantity is diminished, will the velocity be increased.

This re-action is attended with fever; quick, small, sharp, jerking, and sometimes a wiry, at others, a compressible, pulse; increased heat and dryness of skin; shrivelled features; want of moisture in the mouth, and a parched and pinched state of the nose and lips; a diminution in all the secretions; desire for fluid, and dislike to solid food; intolerance of light and sound; inability to sleep, and most distressing pain in the head. The sensations are rendered intensely acute; and the slightest noise, especially of a sudden character, is most distressing. Palpitations are often present; so also are panting, dyspnœa, and a degree of hurry and alarm on waking from a dose, or being suddenly disturbed.

The pain in the head is almost universal after hæmorrhage, and is very characteristic. It is described as being similar to the thumping of a small hammer within the skull, or the ticking of a clock; sometimes, but more rarely, it resembles the roaring of the sea, or the singing of a kettle. Every movement of the head is attended with great uneasiness; and if raised from the pillow, a sense of fainting supervenes. I have little doubt that this sensation of thumping arises from the column of blood being lessened in diameter, and the arteries not being sufficiently distended by their contents. As these vessels are highly elastic, they contract in their calibre in proportion to the decreased quantity of blood that they contain. When they are fully filled, and their coats are duly distended, they propel the blood onward with but slight effort; but when partially emptied, so that the natural and healthy agreement between their capacities and the measure of their contents is disturbed, they are compelled to beat violently, in order to carry on the circulation; and this forcible contraction propagates an increased jerk to the fluid.* Most probably this state pervades the whole body; but it is only perceived in the brain, in consequence of the structure and peculiar sensibility of that delicate organ.†

Treatment.—If we bear in mind that the cause of the morbid symptoms is referable to the decreased quantity of blood circulating, and that its augmented velocity is dependent on the diminution in its quantity, we shall never be much at a loss in directing our treatment. Our object should be to diminish the present irritability—to alleviate the febrile symptoms—to remove the distracting headache—to preserve as much as possible the remaining power—and gradually to add to the mass of circulating fluid.

With the latter view, nutritious diet must be frequently administered;—sago, arrowroot, milk, jelly, and strong broths, in as large a quantity as the stomach will digest. To diminish the irritability of the system, and moderate the excessive action, saline medicines may be given, either in effervescence or not; cold sponging may be employed to the hands, arms, and face; and opium may be prescribed in tolerably large doses. Both the mental and corporeal irritability produced by a large loss of blood, is better alleviated by opium than any other remedy: and although as a principle we avoid opium when much headache is present, in this particular affection the drug, either alone, or combined with salines or ipecacuanha, will often be found most serviceable. Nevertheless, it is not to be expected that any medical means will *rapidly* remove the febrile excitement and the cerebral distress; but it will generally be observed, that as fresh blood is formed by the assimilation of nourishment, all the symptoms will gradually subside. I cannot help thinking, indeed, that if no medical treatment, beyond proper attention to the bowels, were employed, —if nothing were exhibited but mild nourishment in small quantities, at regular intervals, the symptoms would of themselves disappear; and I am persuaded, that in no few instances medical interference has been of decided injury.

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* I have reasoned in the text as though the arteries contracted upon their fluid contents with an active propelling force. Dr. J. C. B. Williams (see Med. Gazette, July 9th, 1841, p. 609) would seem to explain the same phenomena in rather a different manner:—"In a full tense state of the arteries, the heart has at each systole to overcome the resistance of the arterial pressure; and in doing this, much of the force of each jet issuing from the heart is lost. But each jet adds to the pressure in the arteries, and thus sustains the continuous stream in their capillary ends, where the flow is less pulsating. In a lax or ill-filled state of the arteries, on the other hand, the heart's jets being less resisted by arterial pressure, are now forcible and abrupt. They are most violent near the heart; and if the vessels be not too empty, they communicate their jerky pulses even to the capillaries, the motion of which is now more pulsating than continuous, and often more oscillatory than progressive."

Whichever of these notions is adopted, the effects observed being exactly similar, and the causes identical, the mode of treatment must be precisely the same.

† This beating pain is so very general, that we may often at once commend ourselves to the confidence of our patient, by the pertinence of our questions regarding it. There is nothing in the whole range of the practice of medicine which attracts the attention of the patient so much, or so forcibly convinces him that his physician understands the nature of the disease under which he labours, as an accurate description of the painful sensations he is suffering. For our own sake, then, as well as his, it is desirable in our general conduct at the side of a sick bed, that we should habituate ourselves, not to hurl a number of random questions at the patient, but only to put such as appear pertinent to the case, and are likely at once to strike his notice; and by means of interrogation we may often enumerate the symptoms present with tolerable exactness. The confidence of the sick, indeed, is a heavy weapon in the hands of his physician; it is sometimes more serviceable than the whole combined armament of the Materia Medica. These observations apply eminently to the case under consideration. If we see a woman blanched, with her skin of a waxen paleness; if we find a jerking, bounding, hæmorrhagic pulse, and learn that a few days before she has suffered a large loss of blood, we may be almost certain that this peculiar pain in the head is present. I have often at such a time remarked the simple inquiry addressed to her, "Whether she is not suffering under a violent beating, like that of a small hammer, within the skull?" followed by a bright flash of the eye, and a sudden illumination of the whole countenance, indicative both of joy and surprise. From that moment she will be assured that, as you so well understand her distressing feelings, you will be most likely to treat her case successfully, and she will resign herself implicitly to your direction.

I would desire to impress a strong caution on the mind of the student against using any means which are likely to diminish the quantity of blood circulating in the system; and therefore all powerful evacuant remedies must be avoided, particularly bleeding. Generally, nothing can be more injurious than the bold use of the lancet under this state of re-action, consequent on the loss of blood;—no treatment can be more unphilosophical;—and yet I have known venesection repeatedly resorted to. Taking blood, indeed, will for a time almost always relieve the pain; but the alleviation is merely temporary,—it only remains as long as the patient continues faint; re-action soon occurs in a still greater degree than before, and an increase of distress is the consequence. It is not reasonable to suppose that this peculiar headache arises from undue determination of blood to the brain; but more probable that it is produced rather by the vessels being too empty. For this reason, I should also avoid leeching and blistering the head, or its neighbourhood. If, indeed, instead of the pale exsanguined countenance,—which is almost invariably present,— there should be a turgid and suffused face, indicating an extraordinary fulness of the veins of the skin, I should presume the same state to have taken place within the skull, and should then apply leeches pretty freely, or use other means to relieve the surcharged vessels. I should object also to brisk purging; for I think I have seen some instances where this practice appeared to aggravate the symptoms. It is certainly proper to take care that the lower bowels should thoroughly empty themselves daily, but not to keep up by medicine such a constant irritation on the mucous membrane of the intestines as will produce a very much increased secretion, and a copious drain from the system generally. A mild purgative may be given every day, more with the view of stimulating the sluggish action of the canal, than of procuring a number of watery stools.

Cold applications to the head, and especially ice, will often relieve the pain in a great degree during the time they are being used; but it returns when they cease to be applied. There cannot exist any objection to the application of cold; it must do good if it bring freedom from suffering; and it can produce no injurious effects subsequently, as powerful evacuants may do.*

We shall be most successful, then, by avoiding powerful evacuants, yet regulating the bowels daily, by the exhibition of saline medicines and Dover's powder, or small doses of ammonia with hyoscyamus, by the application of cold to the head, by sponging the face, arms, and hands with diluted vinegar or cold water,—provided there be increased heat of skin,—by admitting fresh air, enjoining perfect quiet, soothing irritability, soliciting sleep, and by a frequent supply of mild, fluid, and nutritive food.

CONVULSIONS.

An attack of puerperal convulsions is one of the most frightful accidents that can happen to a patient under labour.

A convulsive paroxysm during labour may occur under two extreme states of system, diametrically opposed to each other; the one, in which the cerebral vessels are inordinately distended with blood; and the other, when they have been drained almost empty, as in the case of excessive hæmorrhage; and it is a curious fact, that the two perfectly opposite states, viz. too great a fulness of the vessels, and too great emptiness, will produce, in this respect, exactly the same phenomena.†

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* The young practitioner may consult with great advantage Dr. Marshall Hall's Treatise on the Effects of Loss of Blood: the profession is much indebted to him for his means of diagnosis between the affections of the different viscera, particularly the heart and brain, produced by excessive depletion, and somewhat similar symptoms the result of inflammatory action.

† It is almost universally observed, that when an animal is bled to death, the last act of life is a most violent convulsion of the voluntary muscles. Andral says, "In an attack of convulsions, the brain is equally affected by an over-abundant, or too sparing a flow of blood to the head." (Med. Gazette, vol. xiii. p. 106.) Some pathologists, indeed, have regarded it as "improbable that any state of things should materially augment or diminish the actual amount of fluids within the cranium," in consequence of the brain being perfectly enclosed within a bony case, and removed from the influence of atmospheric pressure.—(Reviewer of Abercrombie's Work on the Brain, Med. Chirurg. Rev. vol. ix. p. 85.) The talented author just mentioned entertained the same view. (Conjectures in regard to the Circulation in the Brain.) So also Clutterbuck (Cyclop. of Prac. Med. vol. i. p. 125, art. Cerebral Apoplexy). I am myself inclined to think that when hæmorrhage to any extent takes place, the cerebral vessels participate, in no small degree, in the

I have already mentioned, that the occurrence of a convulsive seizure, in a patient who has suffered profuse hæmorrhage, is to be regarded as a highly dangerous, and frequently a mortal symptom. Such cases have been very appropriately designated "anæmic convulsions:" they are not to be looked upon as true "puerperal convulsions:" this term should be restricted to the disease that I am next about to describe.

Period at which they occur.—The true puerperal convulsions may occur at any period of the latter half of pregnancy, or in any stage of labour; they not unusually first make their attack many hours even after the child is born, and the placenta expelled; when the process is popularly considered as completed; and occasionally they appear after the lapse of some days. We meet with them, however, for the most part, during the last few weeks of utero-gestation, or the first stage of labour, previously to the entire dilatation of the os uteri. At other times, but more rarely, they occur when the head is pressing on the outlet of the pelvis, and distending the perineum—when the uterus has been acting excessively strongly, and the labour is somewhat lingering. The great bodily exertion consequent on the parturient efforts, may, in such a case, have much influence in their production. Convulsions rarely appear early in pregnancy: but Perfect gives us two cases* in which they attacked the patient before quickening, and Meigs informs us he once witnessed a desperate case in a young woman five months gone in her first gestation.†

Universal liability to them.—These convulsions may assail women of all ages and of all kinds of constitution; women with their first child, as well as those who have borne many; but they by far most frequently accompany first labours;‡ and the kind

general inanition of the circulatory system. I would beg to refer my readers on this subject to three admirable lectures by Dr. George Burrows, delivered before the College of Physicians, and published in the Med. Gaz., April 28th, 1841, *et seq.* He there shows that Monro *secundus*, and Drs. Abercrombie, Clutterbuck, Watson, and Kellie, of Leith, believe that "the absolute quantity of blood within the cranium is at all times nearly the same, whether in health or disease, in life or death." While, on the contrary, Drs. Cook, Hooper, Carpenter, Sir B. Brodie, and Portal, are quoted to prove that *congestion* does assuredly take place, as in the case of death by hanging; and some experiments performed by himself are detailed to prove that *anæmia* of the brain, also, is induced by fatal hæmorrhage; and that by bleeding "we actually diminish the quantity of blood in the cerebral vessels." These experiments go to disprove the hypothesis arrived at by Dr. Kellie, from the experiments which he had previously made.

* Cases in Midwifery, XLV. and XLVI.

† Obstet. p. 462; see also "Woman and her Diseases," p. 508.

‡ "Women in their first pregnancy, and those who carry more than one infant in utero, are most liable to convulsions" (Hamilton, Pract. Obs. p. 356. See also Denman, chap. xvi. sect. 2), &c. Out of 19 cases recorded by Dr. Joseph Clarke, 16 were first births. (Collins, p. 200, note.) Of 36 by Merriman, 28 were first births (p. 141). Of 30 by Collins, 29 were first births (p. 200). Of 20 by Meigs, 12 were first births, and one not known (p. 457). Of 26 by my father (part 2), in four no

of patient most obnoxious to their attack is the stout, florid, robust woman, of strong muscular fibre, with a thick-set form, and short thick neck—just such a person as would be considered predisposed to apoplexy. But the most delicate and slim female is by no means exempt from the danger of a convulsive seizure. There is little doubt that a naturally excessive sensitiveness of the nervous system may predispose to the disease; and I have traced an attack, more than once, to originate in mental emotion, particularly grief, despondency, or other depressing passions.

Analogy to Apoplexy and Epilepsy.—Puerperal convulsions are more allied to apoplexy than any other disease of the body, inasmuch as they usually depend upon exactly the same causes.

mention is made as to whether they were first pregnancies; but of the 22 remaining, 15 were so; three were not, the women being at full time; four were not, the births being under seven months. These cases were selected by him out of a great number, either because of their dangerous symptoms, or to exemplify some point of practice, without reference to their being first or subsequent births. Of 105 cases which I have myself attended, 36 occurred before labour was instituted, 46 during the process, and 22 after its termination. There were four cases of twins; 75 were first and 30 subsequent births; one was the woman's eighth, one the ninth, and one a tenth child. In six mania supervened; in five of these the maniacal symptoms succeeded the fits; in one preceded them; two of these patients died; in one mania followed the fits and paralysis supervened on the mania; in two other cases, also, paralysis of the right side, one partial, the other perfect, supervened on the convulsive seizure and the patients died; and in another slight numbness of the arm and partial paralysis came on, and she recovered. In two cases the patients had been the subject of epilepsy before marriage. One had been seized with convulsions after her first child, and this time in labour of her second. The first child, which was living, had been subject to fits from its birth. In another they occurred towards the close of three successive pregnancies. 21 of the 105 women died. Of the children 67 were delivered naturally; 13 by craniotomy; 14 by the forceps; one of which was a case of twins, and both children were delivered by the same instrument; nine were delivered by turning, the head presenting; there were five breech cases, one of which was a case of twins, both children presenting with the breech; there was no transverse presentation; only 41 out of the 109 children were born living; and in 19 of these cases the convulsions did not appear until after the child's birth. Two patients were seized six days after labour, another nine, another ten, and a fourth seven; the convulsions ceased for a week; she then had another series of fits, of which she died; and a fifth was attacked 18 days subsequently. This is the longest period I have known intervene between the birth and an accession of this dangerous disease. On June 24th, 1851, I saw a patient in consultation, who had been seized with a convulsion fit on the evening of the 22nd. She suffered three attacks during the 23rd, became completely comatose, with frequent fits, on the morning of the 24th, which state she was in when I visited her, and died on the morning of the 25th. This woman, æt. 27, had been delivered of her first child by the forceps, after a painful labour, on the evening of the 6th. On the third day she was attacked with peritonitis, which was subdued by bleeding and other appropriate remedies. At the commencement of the second week, diarrhœa harassed her a good deal; but this was checked by acetate of lead and opium, and she seemed to be progressing satisfactorily. She was subjected, however, to great mental annoyance, in consequence of the drunken habits and violent conduct of her nurse; to which, indeed, as an exciting cause, I have no hesitation in attributing the disease that destroyed her. On the day before the convulsions showed themselves in a decided manner, spasmodic twitchings of the right arm, with partial paralysis, came on. In this instance it will be observed, the first convulsive seizure did not occur till the completion of sixteen days from the delivery.

There is also an analogy in respect to the stertor and stupor, which form prominent features in both diseases. They would likewise seem to bear some resemblance to epilepsy, from the violent spasmodic paroxysms which constitute the most striking symptom of puerperal convulsions. The disease is unlike apoplexy, however, because in common apoplexy we seldom have the convulsive fits, and very rarely is permanent paralysis produced as a consequence of puerperal convulsions.*

Again, it is seldom that in epilepsy the convulsive paroxysms follow each other so rapidly as they do under an attack of the disease we are now considering; and they have a tendency to return at different periods throughout the whole or a considerable portion of life. This latter observation does not apply to puerperal convulsions; nor is there any *aura epileptica* observable in this affection. Upon the whole, it appears to me that the convulsions of the puerperal state bear much more resemblance to apoplexy than to epilepsy, because they are produced by exactly similar causes,—those causes, indeed, acting on the system under peculiar circumstances,—and because they are relieved by exactly the same means.

I look upon a case of puerperal convulsions to be, in fact, one of apoplexy, only that we have superadded to the common apoplectic phenomena violent spasmodic contractions;† and this symptom is dependent upon the irritable and excitable state of the nervous system always in a greater or less degree accompanying pregnancy and parturition. We can readily imagine that in a highly excitable state of the nervous system, any irritation which the brain might suffer would be more likely to produce convulsive action of the muscles than the coma attendant on common apoplexy; and this opinion is borne out by our observations on infants.

In infancy, as anatomical investigations demonstrate, the quantity of nervous tissue bears a very large proportion comparatively to the bulk of the body; and we may presume that its influence on the body is in proportion to its development. Now we very rarely see such a disease as the apoplexy of adult age in an infant; but when the brain is irritated by pressure or other causes, convulsive paroxysms are excited. I consider, then, the case of puerperal convulsions to be exactly analogous to that of infantile convulsions, and that they are both of them allied to apoplexy; the causes, however, acting upon the system under a highly excitable state. This view of the case, whether correct or not, is practically valuable, and will lead to the most judicious treatment. It was the want of tracing this analogy between puerperal convulsions and apoplexy that introduced the destructive practice until of late years so universally adopted.

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* However desirable and proper it may be, for the purpose of carrying out a system of minute nosological arrangement, to divide puerperal convulsions into different species—such as tetanic, cataleptic, hysteric, epileptic, apoplectic, &c.—it appears to me that such a mode of treating the subject tends only to confuse the student and divert his mind from the chief object to which it should be directed,—the value of the various curative means which we have it in our power to apply. Dewees classes them under three heads, the *epileptic*, *apoplectic*, and *hysteric*. Baudelocque arranges them under the titles of *tetanus*, *epilepsy*, and *catalepsy*. Merriman styles them *dystocia epileptica;* while Velpeau and Desormeau prefer the generic term *eclampsia*.

† "When a woman in labour is seized with convulsions, attended with stertor, frothing at the mouth, lethargy, or total insensibility, she may be considered as suffering an apoplectic paroxysm." (Bland on Human and Comparative Parturition, 1794, p. 138.) "When a state of coma and stertorous breathing prevails, the disease assumes the semblance of apoplexy." (Ramsbotham's Pract. Obs. part ii. p. 247; p. 319 edit. 2nd.)

Atmospheric influence.—I have remarked that puerperal convulsions are much more frequent in hot weather than in cold, and especially at times when the atmosphere is charged with electricity. Thus, they are oftener met with towards the end of summer and in the autumn, or in the spring, when a few unusually warm days have suddenly burst upon us. My father many years since called my attention to the fact of convulsions being more frequent when (to use a common expression) there was "thunder in the air," than at any other time; and he has pointedly mentioned such a conviction in the second part of his work.* Andral † has more recently stated his opinion to the same effect, when speaking of convulsions in general:—"The electrical state of the air on the approach of a storm has often served to bring on a convulsive fit." And Denman ‡ remarks:—"It has been justly observed, that women are far more liable to puerperal convulsions in certain years and seasons than in others;" and he then proceeds to enumerate, among other causes, "the particular influence of the air." Nor did this circumstance escape the acute Smellie; for he states, that in the course of the year 1747 he attended several patients who were attacked near their full time with convulsions; that other practitioners also saw similar cases during the same time, "so that they seem to have proceeded from the constitution of the weather." § Whether this liability, indeed, merely arises from women not being able to bear the fatigue of labour as well in hot weather as in cold, or from the blood being then more rarefied—or whether it be that such kind of weather exerts some specific influence over the system, particularly of puerperal women, which predisposes to these convulsive attacks,—I cannot pretend to determine; but I suspect that the peculiar effect is chiefly to be attributed to the atmosphere being highly charged with the electric fluid.

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* Pract. Obs. p. 248; p. 319 second edit.

† Op. et loc. cit.

‡ Introduction to Midwifery, chap. xvi. sect. 2.

§ Mid. 1779, vol. ii. p. 285.

Proximate cause.—The phenomena exhibited in an attack of puerperal convulsions evidently point to some excessive irritation existing in some most important part of the nervous system; and it would appear that either the brain or the spinal cord is the seat of this alarming derangement. Pressure is probably the most common proximate cause, arising either from extravasation of blood consequent upon a ruptured vessel, exudation of serum, or—by far most frequently—simple vascular congestion. In dissections that I have conducted, I have met with a clot of blood in the centre of one of the hemispheres, a considerable layer of coagulum between the pia mater and arachnoid membranes, effusions of serum into the ventricles, and at the base of the cerebellum; as well as a highly loaded state of all the blood-vessels both of the brain itself and of its membranes. But the disease has often proved fatal, without any organic lesion being evident on dissection, and without even the vessels being observed to be preternaturally full, as I also know from personal experience.[*] In this respect, even, there appears a strong analogy between apoplexy and puerperal convulsions; for Zuliani, of Brescia, in 1780;[†] Kortum, of Dortmund, in 1785;[‡] and, more recently, Abernethy, among us, have recognised a species of apoplexy, to which the term *nervous* has been given. In two cases, also, related by Abercrombie,[§] of his *simple apoplexy*, no abnormal appearance was observed after death.

Remote causes.—Into the remote causes it is not my wish to enter at any length, because the subject is at best but unsatisfactory and little understood. They have been ascribed to articles of food remaining undigested on the stomach, or irritation existing in some other part of the alimentary tube; to general irritability of constitution;—to a delicate and luxurious mode of living;—to the depressing passions;—to an overloaded state of the system;—to over-distension of the uterus; to distension of the bladder; and to the death of the child. But the affection, in my opinion, originates most frequently in some deranged state of the uterus itself, probably in its nervous system, and consists in some irritation propagated from that organ to the brain.[||]

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[*] See my father's Pract. Obs. part ii. p. 248, first edition; p. 320 edition 2nd.

[†] F. Zuliani de Apoplexia, præsertim Nervea. Lipsiæ, 1780.

[‡] Car. G. Theod. Kortum de Apoplexia Nervosa. Gött. 1785; apud Ludwig. tom. iv.

[§] Diseases of the Brain and Spinal Chord, 1828.

[||] I have met with some cases which have strongly impressed me with the idea advanced in the text, the most striking of which is the following:—I was called, some years ago, by one of the midwives of the Royal Maternity Charity, to the assistance of a woman under puerperal convulsions, towards the close of pregnancy. When I arrived, I found she had been bled largely by a medical friend living in the neighbourhood, who had been sent for on the instant of the attack. The bleeding had relieved her partially, but it was thought right to repeat it. A third quantity of blood was taken some time after, with such a beneficial effect, that the convulsions

Symptoms.—The symptoms of puerperal convulsions are so prominent and strong, that if once the disease has been seen, there is no likelihood of its being mistaken. If they occur, as is usually the case, during the first stage of labour, the patient is probably sitting or walking; she may have just been joining in conversation; and, without giving any previous warning, she suddenly falls down in a strong fit. All the voluntary muscles of the body are

entirely ceased, and in a few hours perfect consciousness had gradually returned. About fifty hours after the attack, active labour came on; and in less than five hours more the child was born, dead. The placenta did not descend, and two hours subsequent to the expulsion of the child I was summoned. I found her perfectly sensible, in good spirits, and she made no complaint. There had been no hæmorrhage, the uterus was not strongly contracted, and the placenta was not entirely within it. Under no greater anxiety than I usually feel, when the placenta is retained, I proceeded in the ordinary way to remove it. The moment I had passed my hand completely into the uterine cavity, the patient turned upon her abdomen, and, without uttering any expression of pain, went into a convulsion, though not of a severe kind; intense coma supervened, which yielded to no treatment I could devise, and terminated fatally in about two hours from the removal of the placenta. The vagina, and especially the inner surface of the uterus, communicated to the hand a more pungent sense of heat than I recollect to have experienced on any other occasion.

About forty-eight hours after her death I made an accurate inspection of the body. The dura mater adhered more firmly than usual to the inner surface of the cranium, but was healthy in appearance; the vessels of the brain contained less blood than ordinary; the plexus choroides were quite blanched; there was no fluid in the lateral ventricles, none between the membranes, at the upper part of the skull, but about two drachms at the base of the brain; no extravasation of blood existed in any part of the cerebral mass. The viscera were all healthy; the uterus was contracted; nor did it present any uncommon appearance.

Here was as clear a case as can possibly be made out of irritation propagated immediately from the uterus to the brain; and I have no doubt in my own mind, that if the placenta had not unfortunately been adherent, but thrown off naturally, the woman would have recovered perfectly.

Two others similar, but not quite so strong, have come under my observation since; and Ingleby has related a case almost analogous; the patient, however, not having suffered any convulsion before delivery. "A highly-esteemed friend of mine once found it necessary to pass his hand into the uterus for the purpose of removing an adherent placenta, the ergot of rye having been previously administered. The introduction was carefully performed. The straining and opposition to his efforts, on the part of the woman, were exceedingly great; and at the moment when the operator's hand had reached the organ, my own hand making counter pressure on the abdomen, the patient became violently convulsed, and died in less than a minute."—(On Ut. Hæmor. p. 186.)

The cause of this convulsion could not have been excessive loss of blood, because Ingleby would doubtless have mentioned that fact, if it had been so; besides, if the woman had been faint from hæmorrhage, she could not have so strongly resisted the efforts made to introduce the hand. He, indeed, expressly gives his opinion, from the state of the pulse, that she died from apoplexy. I look upon this case as one also proving that the remote cause of this kind of convulsion often exists in the uterus, and that the irritation is propagated through the agency of the nervous system to the brain. Murphy (Lect. on Mid., p. 381) records a case that occurred under his own care, very similar to the last. The patient had such a profuse discharge of blood after the birth of the child as to induce him to remove the placenta. She made considerable resistance; in the struggle was seized with convulsions, and died in a quarter of an hour. The comparative frequency of both peritonitis and hysteritis, after puerperal convulsions, as noted by Collins, Gooch, and others (see p. 471 of this work), would also go far to prove that the remote cause is situated in the uterus.

thrown into a state of violent spasms, alternating with relaxation, so as to produce the most rapid and powerful contortions and struggles; the fore-arms and legs, but particularly the former, are jerked backwards and forwards with great rapidity; and the strength of two or three assistants is required to prevent her throwing herself off the bed, or in some other manner doing herself an injury. The face becomes turgid and livid, swollen by the increased quantity of blood with which the vessels are loaded. The throat also seems to swell, the carotids beat inordinately, and the jugular veins appear prominent. The countenance assumes a most hideous expression, partly from the suffused state of the features, and partly from their distortion and convulsive action. The eyes seem starting from their sockets; and, in consequence of the spasmodic action of their muscles, are drawn obliquely upwards, one to the inner and the other to the outer canthus; so that none of the pupil, and but a small portion of the cornea, can be seen. The eye-lids are half open, and tremulously agitated; the pupils themselves (if the eyes can be so opened as to obtain a sight of them) are generally dilated; sometimes, however, they are more than usually contracted (or one is preternaturally contracted while the other is widely dilated); and I have then observed them expand, in the interval of the fits, on the application of light. The lips partake of the general convulsion. The angle of the mouth is drawn upwards to one or other side, and twitched spasmodically. At the commencement of the fit the lower jaw is depressed and drawn considerably to one side; but the temporal and masseter muscles soon act with amazing strength, and firmly clench the teeth together. The tongue is almost invariably protruded beyond the gums; and the muscles of the jaw contracting powerfully at the same time, catch it between the teeth, and lacerate it dreadfully. A quantity of frothy saliva escapes from the mouth, generally tinged with blood, which issues from the wounded tongue, adding very much to the hideousness of the aspect. The breathing is deep, irregular, and laboured, and performed with a sharp hissing noise, from the air being impeded in its passage, partly by the clenched teeth, and partly by the saliva, which hangs about the lips. The pulse, during the paroxysm, varies, being full, slow, and oppressed, at the commencement and before the attack, and increasing in velocity as the intensity of the fit becomes greater.

As these frightful and alarming symptoms occur so suddenly, it is not surprising that they should strike the attendants with terror and dismay. So general and powerful is the dread created, that every one, in the distress of the moment, is running in search of they know not what; and the medical attendant, deprived of the assistance of the bystanders, is often compelled to collect for himself whatever he may require.

After an uncertain time, the violence of the fit abates; and probably in a few minutes the convulsion will have quite disappeared. The patient will then, perhaps, slowly recover her consciousness: she appears as if she were awaking from sleep, is perfectly unaware that anything dangerous or extraordinary has happened, and has no recollection whatever of the interval. She will most likely complain now of an agonising pain in the head. This truce will quiet the attendants, and restore something like tranquillity in the lying-in room. Short-lived, however, are their favourable expectations: another attack will presently dissipate their hopes, and again all are thrown into confusion.

At other times, and more frequently, although the more tumultuous symptoms of the attack have subsided, the patient remains comatose, without feeling or motion, lying in the senseless state of apoplectic stupor; the cheeks puffed out in expiration; and the breathing heavy, dull, and stertorous. At others, again, a certain degree of consciousness returns, a knowledge of persons and objects, but an inability to articulate or make the wishes known; and often, with a partial return of consciousness, there is a constant rolling about the bed, and a low and distressing moaning; or an unintelligible muttering, as in the delirium of low fever. I have observed, too, not unfrequently, deep and almost incessant yawning; and, provided no remedial means have been used, the latter symptoms will in time supervene between the fits; although for a considerable period after the commencement of the attack the patient had been perfectly sensible throughout the intervals. During the continuance of the fits, uterine action is not suspended; but no signs of pain are manifested by the woman, if she remain comatose. Sometimes, with each return of contraction, a fresh paroxysm occurs; so that we may count the frequency and duration of the pains by the number and length of the fits. Occasionally, under convulsions, dilatation and expulsion have gone on so rapidly, that the birth has taken place, before the attendants were aware that labour had begun:* and many instances have come under my own eye of a child being expelled during a strong fit. Baudelocque states, that he has seen some cases in which he found the child between the woman's thighs, though "an instant before he could discover no disposition for delivery."† Thus convulsions neither suspend nor interfere with efficient uterine action.

The infant is generally, though by no means universally, born dead, when the woman has been the subject of convulsive seizures, especially if the attack has occurred early in the labour, and continued for any length of time. It is difficult to account for this circumstance: pressure on the child's body or on the funis umbilicalis, alone, cannot explain it. I suspect it is owing to the necessary changes in the fœtal blood not being effected during its circulation through the placenta, or to some baneful influence propagated to it from its parent. Denman* justly remarks, that the death of the child is rather to be considered as a consequence than as a cause of the convulsions; and Spence gives a case in which the mother having died of convulsions before there was any disposition to labour, the Cæsarean section was performed immediately after: the child was extracted alive, was itself soon seized with convulsive paroxysms, and died in less than an hour.†

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* See my father's 110th case, Pract. Observ. second edition. In the first edition it stands the 162nd.

† Translation, parag. 1109. This must surely be an exaggeration; but I have known no few instances where the persons in attendance would not believe that the child was born, because they had no idea that labour was instituted.

Premonitory symptoms.—Convulsions often arise suddenly, as just described, without any premonitory symptoms: sometimes, however, and I think most generally, there are signs which appear a few days previously to the convulsions showing themselves; and at other times there are some which immediately precede the fit itself. Thus a woman will seem perfectly well, bearing the commencing pains of labour with great fortitude, and in good spirits, when she begins to ramble in her mind, talks incoherently, and will perhaps suddenly declare that there is a bright light in the room; and a convulsive paroxysm immediately succeeds. In my father's 176th case,‡ the attack was ushered in with the exclamation that the room was studded with diamonds. After such a declaration, then, we might expect an outbreak of this frightful disease; but little time would be granted us for acting in prevention, since the more decisive symptoms would almost instantly follow.

But there are others which appear a few days or hours before the fit, leading us to suspect that convulsions are likely to occur; but yet not so strongly marked as to warrant us in saying that the patient must necessarily experience an attack. These are such as we are in the habit of referring to an overloaded state of the brain;—intense headache; a feeling as if a blow was inflicted on the head; giddiness; a sensation of intoxication, and inability to walk straight; drowsiness; singing in the ears, and deafness;

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* Chap. xvi. sect. 2.

† System of Mid. Appendix, case 47.

If the paroxysms do not come on till after the termination of the labour, the child is almost always living; and in proportion to the number of fits, the length of time the disease has lasted before delivery, and the general violence of the attack, will be the probability of the infant being born dead. M. Menard thinks the child's death is owing to its having suffered convulsions before delivery, and states that the contraction of its features and limbs on its birth, proves this to be the case. (See Dict. of Pract. Med. art. Convulsions.) I have not observed such an appearance of the infant in any case.

‡ First edition; 119th of the second.

total or partial loss of sight; scintillæ, or *muscæ volitantes*, floating before the eyes in rapid succession; impeded utterance; numbness or cramps in the arms, and occasionally severe cramps in the stomach. Such symptoms, especially in full habits, should never be neglected; we may infer that they arise from a fulness of the vessels of the brain, and in most instances may deplete the patient both by bleeding and purging.*

In most cases of puerperal convulsions, the urine contains albumen in variable quantities; sometimes only a trace being discoverable, at others the fluid being perfectly loaded: and this is especially the case, if any degree of general anasarca be present. After the cessation of the fits, as the patient recovers her health, the albumen gradually disappears, and at the end of a week or two has ceased to be excreted.

Whenever there exists a *puffy* condition of the face, eye-lids, and hands, towards the end of gestation, particularly if albumen be detected in the urine, the mind should be kept alive to the chance of convulsions appearing during labour.† An œdematous state of the *lower* extremities will indeed often occur without any such danger being threatened; but that is to be explained upon the principle of local pressure, and is very different to the disposition to anasarca, pervading the upper part of the trunk and the superior extremities.

It is not easy to explain why albuminuria and puerperal convulsions should so often be coexistent. It may depend, perhaps, as Dr. Cormack and others have supposed, on the pressure to which the kidneys are subjected, preventing the due return of the blood through the emulgent veins, or simply on there being more than the healthy and requisite supply of albumen in the blood; and in that case it would indicate the method resorted to by nature for freeing the system from the superabundant quantity.

Since this state of the urine is so common an attendant on the disease we are considering, granular degeneration of the kidneys has been looked upon as its invariable cause. That in some instances renal disease may be complicated with, or even the occasion of, convulsive seizures either before, during, or after labour, is very probable; but that this is neither universally nor generally so, I can positively assert from personal observation. In the majority of the cases, indeed, that I have had to treat, the patients were strong, healthy young women, without any symptoms of œdema, and whose appearance did not give the least impression of their being the subjects of organic disease. In every instance of recovery, the albumen, where it has been present, disappeared within a few days after labour, which would not have happened if there had been granular disease of the kidneys. Were this always the cause, albumen ought never to be absent in a case of puerperal convulsions: we know, however, that the reverse of this position obtains,—that convulsions not unfrequently appear when the urine is free from any albuminous deposit whatever.*

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* "The only real resource in the puerperal convulsions is in the use of the lancet; and the rule ought to be established, that a woman is menaced with convulsions if she is affected with headache near her term, especially if that headache be referred to the crown, or to some point (clou) that could be covered with the end of the finger. I intend never to hear such complaint without pondering on the value of the indication it throws out; namely, that the lancet, the lancet, and nothing but the lancet, is worthy our confidence." (Meigs, Obstet. p. 462.) To this work I would refer for two graphically described cases,—one in which convulsions occurred very soon after premonitory symptoms had become developed; the other, in which, although very similar indications appeared, the more alarming symptoms were warded off by venesection.

† Hamilton was the first to record the fact that puerperal convulsions were often preceded by anasarca (Duncan's Annals of Med. 1800, vol. v. p. 313). A similar observation was soon after made by Demanet, who considered anasarca one of their essential causes (Recueil Périodique de la Société de Méd. tom. ix. 1801-2, p. 110.)

Prognosis.—Our prognosis must be most guarded in all cases of puerperal convulsions; for it is a highly dangerous affection; and the danger is in proportion to the length and strength of the fits, and the shortness of the intervals; but more especially to the degree of consciousness between the paroxysms. If the patient lies in a state of complete stupor, accompanied with stertorous breathing, when the paroxysm has subsided, and insensible to any ordinary stimulus that could be applied, even though the fits might be of short duration, I should consider her in greater danger than if the convulsions were stronger, with a return to perfect consciousness in the intervals between the attacks. Usually, the stronger the fits the deeper is the accompanying coma; but that is not always the case: and I would rather form my prognosis from the intervening state than from the actual violence of the fits themselves. We may comfort ourselves with the assurance, however, that,—although convulsions are so dangerous, and although our prognosis must be expressed most doubtfully,—still, under our present improved treatment, the danger is scarcely in proportion to the frightfulness of the patient's appearance; and the excessive alarm occasioned. The terror created in the minds of the friends is often so great that they at once give up the case as hopeless, and conceive the patient must be dying. In this respect, convulsions and hæmorrhage are strongly contrasted with each other; in the latter case, it not unfrequently happens that the fatal event is stealing on so insensibly, that the anxious friends, who are watching by the bedside, are not aware of the impending danger until there is but little chance of recovery left. If we could be certain, indeed, that no permanent injury had been inflicted on any part of the nervous system, I think we might with much confidence hope for a favourable issue in most cases of puerperal convulsions.

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* On the subject of the coincidence of puerperal convulsions and albuminuria, M Hippolyte Blot submits the following ten propositions, with almost all of which, I perfectly coincide:—Albuminuria is frequent in pregnant women. In almost all cases it is the result of a simple functional hyperæmia of the kidneys. It is remarkable and inexplicable that *primiparity* seems to be a predisposing cause. Besides the presence of albumen in the urine, other signs of this condition may be observed,—such as œdema and lumbar pains. The albuminuria of pregnancy is always free from febrile excitement. In nearly every instance the albuminuria disappears a few hours after labour. This condition of pregnancy is free from danger, when unaccompanied with cerebral congestion; it has no influence on the course or termination of gestation. Every case of eclampsia seen by M. Blot has been accompanied with albuminuria. The relation between the two is obscure. (L'Union Médicale, Oct. 10, 1850.) Simpson (Obst. Mem. p. 830) says: "Albuminuria and its effects are far more common in first than in later labours, and then constitute a disease, which in general disappears entirely after delivery. Albuminuria, with convulsions, &c. occurring in any labour later than the first, generally results from fixed granular diseases of the kidney, and does not disappear after delivery." The first half of this sentence is true enough; but I do not know on what data, or on what principles, the learned professor has arrived at the conclusions set forth in the latter half. In the memorandum of one of my cases where the attack first showed itself after-delivery, I find "urine loaded with albumen, quite gone in six days;" in another of the same kind, "loaded with albumen, gone in seven days;" and a similar remark in many others.

Treatment.—Our first duty, on the accession of a fit, should be to protect the patient from injuring herself by the violence of the agitation into which her whole person is thrown; and then to endeavour to prevent a recurrence of the paroxysms. With the first intention, one or two strong assistants should restrain her, so as to preclude the possibility of her throwing herself off the bed, and striking her head or arms against any hard body. Advantage must be taken of the depression of the lower jaw, which occurs at the commencement of each convulsive paroxysm, to insert some hard substance between the molar teeth, with a view to protect the tongue. A piece of fire-wood,—which can generally be procured on the instant,—will answer the purpose perfectly well: it should be wrapped round with a handkerchief or small fold of linen, and kept steadily in its place by an assistant, till the end of the fit: if allowed to slip out for a moment, the jaws may be forcibly closed, and extensive injury sustained. I have many times known the tongue so swollen by inflammation, consequent on laceration, that the teeth could not be brought together for some days.

Means must next be taken to relieve the patient effectually. Believing that the cause most commonly consists in pressure to which the cerebral mass is subjected, the same treatment must be adopted that we would have recourse to under ordinary apoplexy; viz. the abstraction of blood, and acting briskly on the intestinal canal. Bleeding is our great reliance—the lancet is our sheet-anchor—and blood may be taken to a very large extent; it may be necessary to draw forty, fifty, or sixty ounces, nay, even more, in the course of a very few hours.* If ten or twelve only be abstracted, the patient seldom obtains much benefit; depletion will avail us little, unless a decided impression be made on the system generally. We observe that a woman will bear the loss of a larger quantity of blood under puerperal convulsions,—as in apoplexy,—without fainting, than in almost any other affection. Venesection, however, had better not be attempted during the paroxysm; for the struggles of the patient are likely to prevent its being properly and beneficially performed. We may content ourselves with guarding her as perfectly as we can until the fit subsides; and when it has passed over, and she lies in a state of coma, or sensibility is somewhat returning, the operation will be easy.

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* "If there be a case in which the bold and daring use of the lancet is demanded, it is the case of puerperal convulsion."—(Meigs, p. 458.)

Her head and shoulders should be raised as high as conveniently may be, a free opening made in one or both arms, and the blood allowed to run in a full stream. At first it will probably flow sluggishly, and dark in colour; afterwards it will come more freely, and of a more natural appearance: and it should not be restrained until a sensible effect be made upon the pulse; or commencing pallor of the lips indicate approaching faintness. We may be compelled to abstract from twenty to thirty ounces before this effect is produced. The quantity, within a certain moderation, should not be regarded: graduated vessels, in such a case, to measure the loss by, are not required; anything nearest at hand will serve our purpose equally well.

Our next indication is to procure copious evacuations from the bowels as early as possible. If the woman be sensible, there will be no difficulty in administering medicine for this object by the mouth; but if she remain still under coma, she may perhaps be unable to swallow. An attempt may, nevertheless, be made to get some cathartic into the stomach; and with this view, ten or twelve grains of calomel may be mixed with a little sugar, and put upon the tongue; and a table-spoonful of infusion of senna and jalap may be exhibited every half-hour, till stools are procured. The probability is, that some part will pass down: for in most instances, if we watch the proper opportunity, deglutition may be accomplished. In case, however, this cannot be effected, a strong purgative enema may be injected, and repeated if necessary; or a drop or two of croton oil, diffused in a few grains of any suitable powder, may be thrown into the mouth, and a second dose administered, should the first not act within a reasonable interval; or both these means may be used in combination. Turpentine and assafœtida have been injected into the bowels with great advantage, and may be had recourse to at any period of the attack. The stools are almost always more than commonly offensive.

By some, emetics have been recommended; but unless there were indications of the stomach containing undigested food in considerable quantity, I think emetics not called for; and commonly, purgatives will answer the purpose of relieving the alimentary canal better than emetics.* To assist in keeping down the action of the heart, nauseating doses of antimony will sometimes be found highly advantageous. Though the symptoms may give way for a time, we are not to expect an immediate cessation of the fits; a fresh attack will most likely occur, moderated or not in intensity, according to circumstances: after the lapse of a short period, therefore, another bleeding may be required; nor should we hesitate to have recourse to the lancet a second or even a third time, if the arterial system regain its power.

As an auxiliary of no mean consideration, the hair may be taken off, and cold applied to the scalp, and the shoulders should be kept in an elevated position. Gooch,† Blundell,‡ and Copland,§ speak of the advantage sometimes to be derived from drawing the woman's person partly over the edge of the bed, and pouring water unsparingly on the head.

I think it useless, while the violence of the convulsions lasts, to attempt the application of cupping-glasses to the back of the neck or behind the ears, or even leeches to the temples; or to blister the shaved head, or nape of the neck. The contortions of the patient's body would prevent the glasses being easily fixed, and there would be a great chance of their being broken, even if properly adjusted. It would perhaps be less difficult to apply leeches, but they are too slow in acting for our present purpose, and the urgency of the case demands more prompt and effectual means. The same disadvantages attach to blisters, even in an increased degree. Not that I object to local depletion; it is certainly desirable to unload the vessels of the brain by any method in our possession; but general bleeding is far preferable to the less powerful resources. Provided, then, the symptoms are but little alleviated,—while delivery is impossible, or would be attended with much hazard,—we may open the temporal artery, or the jugular vein; and thus secure the advantages both of general and local depletion at the same time.‖ Sinapisms also may be applied advantageously to the calves of the legs, the ankles, or the pit of the stomach.

But we may be fearful of taking any more blood, either from the arm or nearer to the seat of distress, while yet the convulsive fits continue unabated in their severity: under such a case we have only one other resource—delivery, if it can be effected. Emptying the uterus will usually put a stop to the fits—at any rate, for a time; and if there be no permanent injury inflicted on the nervous system, it will generally mitigate them most materially. According to the progress the labour has made, must be the means we employ for this object. Thus, if the fœtal head be low down in the pelvis, so that we can feel an ear, we may have recourse to the short forceps; if it be not within their scope, the long forceps may be employed; and if it be impacted in the brim, we may be driven to the use of the perforator. Again: should the membranes be unbroken, or the head be quite disengaged above the brim, never having entered the pelvis at all, we may turn the child, and deliver by the feet. Of all these methods, we should much prefer delivery by the forceps, if it could be effected without injury; but, unfortunately, the operation is rendered very difficult, and in no small degree hazardous, by the rapid contortions accompanying each fit, and the incessant movements of the person in the interval of the paroxysms; which condition is mostly present when delivery is required. Although, then, the alternative offered by craniotomy is painful to contemplate, we should resort to it rather than run the risk of inflicting extensive injury on the mother's person. The child, indeed, as I have before stated, is very frequently born still, after the mother has suffered from convulsions; but the chance of its previous death would not warrant us in taking the perforator in hand, if delivery could be accomplished with safety in any other manner.

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* Were I summoned to a patient soon after she had made a hearty meal, and especially if she had eaten freely of shell-fish, or other not easily digestible food, I should exhibit a brisk emetic before resorting to purgatives.

† Compend. p. 247.

‡ Obstetricy, by Castle, p. 648.

§ Dict. of Pract. Med. art. Convulsions, p. 484.

‖ "When from circumstances it is difficult to procure a sufficient supply from the arm, the temporal artery may be opened, or cupping-glasses applied behind the ears or on the temples."—(Locock, Cyclop. of Pract. Med. art. Puerperal Convulsions.)

Neither is the operation of turning under convulsions free from objections. It would be most unwise to attempt its performance if the membranes had been ruptured for any length of time, and the uterus were strongly contracted round the child's body; because of the difficulty we must encounter, and the danger we must necessarily incur. Nor would it be judicious to attempt the forcible dilatation of the os uteri by the hand, especially if it be rigid. Bearing in mind that the remote cause probably exists in the uterus, and that the fits may owe their origin to excitement propagated from that organ to the brain, we should be most cautious not to add another source of irritation by our manual efforts. Under such a state of things, bleeding should be carried to its fullest extent, rather than delivery be attempted. If, indeed, the mouth of the womb be open and flaccid, offering little or no resistance to the passage of the hand,—particularly if the woman have had children before, and if the membranes be still entire at the time when it is thought requisite to evacuate the uterus,—

turning might be undertaken with every prospect of a happy termination.[*]

Even emptying the uterus, however, does not always put a stop to the fits; though they generally become less violent and frequent when the labour is perfected. If they continued equally as strong after the birth as before, whether the delivery had been natural or artificial, I should then suspect that some lesion had taken place within the brain, and should look upon the case as dangerous in the extreme. Still, a continuance of the same means may be used, in a modified degree; leeches, cupping (if it can be accomplished), and blisters, may now be had recourse to, and mustard cataplasms to the abdomen, the feet, or calves of the legs, in conjunction with cold applications to the head, and a continuance of purgative medicines by the mouth, and turpentine or assafœtida in enema. The same plan, aided by perfect quietude, a darkened apartment, elevated position of the upper part of the trunk, and the sparest diet consistent with the due performance of the various functions of the body, will also be found efficacious in removing the distressing headache which often remains for some days after a convulsive seizure, but which gradually disappears under such treatment. When recovery takes place it is for the most part perfect, gradually brought about, and no trace remains of the serious attack the patient has suffered.

Merriman[†] mentions having "known two or three instances of mania occurring as soon as the convulsions ceased, and remaining for some weeks, yet the patients ultimately got well;" and another of true chronic epilepsy, which continued for some years, until the woman died of pulmonary disease. Chronic epilepsy has not happened as a sequela of puerperal convulsions under my own observation; though, as I have stated above, two patients I attended had been the subjects of epilepsy before marriage; in five, mania followed; in four, paralysis, either perfect or partial;[‡] and I saw one patient in whom the fits appeared in three successive pregnancies. Dewees[§] mentions a case where the third and fifth labours were attended with convulsions, as well as the first; and he attributes the return to neglect of proper management during the last weeks of pregnancy. Both Perfect[*] and Portal,[†] also, as well as Baudelocque[‡] and Capuron,[§] have handed down instances of convulsions attacking the same patient in subsequent labours.

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[*] I never knew an instance of a patient dying under puerperal convulsions, with the fœtus within her. Labour seems to be always instituted soon after the seizure, although it might not have been developed previously. Even when the attack has appeared before the termination of gestation, uterine action has been established; so that delivery may, in the great majority of cases, be effected artificially, if it be not accomplished naturally.

[†] Synopsis, p. 140.

[‡] Lamotte (Traité des Accouch. edit. 1745, Obs. 363) notes one case of convulsions in which paralysis occurring before delivery continued more or less for six months; but he appends to the case the remark, that "this very attack of paralysis proves the disease to have been, not puerperal convulsions, but apoplexy; because paralysis is not a sequela of puerperal convulsions."

[§] System of Mid. p. 502.

The contrast between the fatality of the cases now met with, and those put on record by Saviard, Portal, and others in the seventeenth century, and Smellie, Perfect, and Spence, in the last, cannot but be a subject of high gratulation to the practitioners of the present day. Hunter, Lowder, and other teachers, were accustomed to state in their lectures,[||] that more than one-half the patients attacked with this disease died. Jacobs[¶] tells us that the case is almost always fatal, scarcely any example being known of a patient having recovered; and in Nisbet's "Clinical Guide"[**] we read, that when coma accompanies the fits, the disease "generally, though not always, proves fatal."

Few, in comparison with the accounts we read in the older books, now terminate unfortunately, if under good care; and the favourable results are to be attributed to the extent to which bleeding and other evacuant means are carried. Gooch[††] used to say that he never had lost a patient under convulsions, when free bleeding had been practised; but that all the women who died under his observation had been bled insufficiently. Eight, ten, or twelve ounces of blood used to be considered as much as it was safe to abstract; and the principal reliance was placed on antispasmodic and *nervous* remedies, as they were called, consisting principally of ether, ammonia, camphor, musk, castor, and opium. Such medicines, as being stimuli, must add to the danger, by increasing the power of the circulating organs, and throwing more blood on the already overloaded brain.

There has been much division among medical men as to the value of opium in puerperal convulsions. Manning,[‡‡] Bland,[§§] and particularly Collins[|| ||] (who combines it with calomel or antimony), strongly recommended it; while Hamilton,[¶¶] Merriman,[***] Burns,[†††] Dewees,[‡‡‡] and my father,[§§§] with I think most practitioners of the present day, consider it injurious. My own observation would lead me strongly to condemn it while the symptoms are urgent; and to be most cautious in its administration—if I used it at all—even after delivery, or when the violence of the attack had abated. Hamilton[*] advocates the exhibition of camphor in large doses; but, for myself, I have seen not the least advantage from this drug during the continuance of the convulsive paroxysms.

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[*] Cases in Mid. case 158.

[†] Pract. Obs. xvii.

[‡] Parag. 1100, transl.

[§] L'Art des Accouch. p. 397.

[||] Merriman, Synops. p. 132.

[¶] Ecole Pratique des Accouch. 1785, p. 238.

[**] 1800, p. 257.

[††] Op. cit. p. 244.

[‡‡] On Female Diseases, 1771, p. 388.

[§§] On Human and Comparative Parturition, 1794, p. 139.

[|| ||] Practical Treatise on Mid. p. 227, note.

[¶¶] Pract. Obs. p. 372.

[***] Synopsis, p. 135.

[†††] Principles of Mid. 5th edit. p. 469.

[‡‡‡] System of Mid. 1825, p. 510.

[§§§] Pract. Obs. vol. ii. p. 271, first edit., p. 351 of the 2nd.

The English physicians have only recently, in comparison, carried the depleting practice to the extent now almost universally adopted; but some of the earlier French authors were strong advocates for the advantage of large bleedings, and Puzos[†] particularly insists on their necessity. Highly valuable, however, as the lancet is under such a state, it may still be abused: rashness must be deprecated here as well as in other diseases; and no more blood should be taken than is sufficient to produce the effect desired, whatever that quantity may be.[‡]

We should be prepared to expect that a patient, after having suffered a convulsive seizure, would have no remembrance of anything that occurred between the commencement of the attack and the time that she regained her sensibility; and we not only find this to be the case, but the disease seems frequently to wipe away all recollection of events that had happened some time before the accession of the fits, while she was perfectly conscious. Thus I have known many instances of a woman, apparently well when delivered, who (having become the subject of convulsions a few hours after) had no recollection of her labour, and was only convinced that she was delivered, by her child being brought to her. My father[§] mentions a case in which, "although the lady at the time of her delivery appeared in perfect health, she had no recollection whatever, after her recovery, of the occurrences during her labour, or indeed of those of *some days* preceding that event: they appeared a blank in her existence." Blindness, continuing for some days, is by no means an uncommon consequence of convulsions; and deafness sometimes, though much more rarely, follows.[*] Denman [†] mentions that in almost every case which he had seen,

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[*] Pract. Obs. page 371.

[†] Traité des Accouch. chap. xvi. art. 2.

[‡] The accidental loosening of the bandage tied round the arm after venesection, seems to have given the first idea of the value of larger bleedings than it was formerly the practice to resort to. This case occurred to Dr Bromfield; and is mentioned by Denman, chap. xvi. sect. 5.

[§] Pract. Obs. part. ii. case 183; 121st of the second edition.

I attended a patient under convulsions on Tuesday, December 8th, 1840; and when she was restored to consciousness, she had lost all recollection of everything that had happened since the previous Wednesday. Her sister came from the country to spend a few days with her on the Saturday before. She was then apparently in her usual health and spirits; she welcomed her with pleasure, and yet she had not the least remembrance of her arrival. On the Monday before her attack she had visited another sister, a patient in St. Thomas's Hospital; in the evening had walked from the neighbourhood of Bishopsgate Church to Temple Bar with her husband and sister; and after her return called on a medical man, whom she had never seen before, to engage his attendance in her expected confinement. She remembered nothing of the visit to the hospital, nor the subsequent walk, nor of seeing this gentleman; which latter circumstance, as he was a stranger, might be supposed to have made an impression. She was equally unconscious of all that passed during the six days. She recovered her sensibility on Tuesday evening, having been in a state of convulsions alternating with coma for about sixteen hours. She went into labour on the following Sunday morning, and was delivered naturally. It was her first pregnancy, and she was about seven months advanced; the child was born dead. She recovered perfectly.

In vol. iii. of the Royale Académie de Médicine, there is a case given by M.

Koempfen, of a cavalry officer, who fell from his horse and pitched on the right parietal bone. He had vomiting and syncope; and a total want of recollection came over him of everything that occurred the day previous to the accident, as well as for some hours after it. In a few days he was sufficiently recovered to resume his duty, but never regained his recollection of what had happened during these periods. A medical friend of mine having visited a patient, also a friend of my own, in the neighbourhood of London, on June 11th, 1849, was thrown from his horse while returning, at 10 A.M. Although, after being brought home, he ordered appropriate medicine for his patient, he remembered nothing that had occurred since seven in the morning; not having the slightest recollection of visiting my friend, nor of his accident. Nor did he recollect anything that happened for twenty-four hours after his fall; although he was conversing quite rationally during the day, not only with his family, but also with his medical friend, who was sent for on the emergency. The last thing that dwelt in his memory was the death of a child, who expired in his arms, at seven o'clock in the morning of the day on which his horse fell with him. Sir Benjamin Brodie gives a case somewhat similar. A young gentleman was thrown from his horse while hunting. He was stunned, but only for a few minutes, and rode home in company with his friends, twelve or thirteen miles, chatting with them as usual. On the following day he had not only forgotten the accident, but all that happened afterwards. (Psychological Enquiries, 2nd edit., 1855, p. 58.) Such an effect has been noticed in other instances of injury on the head; and persons who have been restored after hanging have been in the same manner deprived of the recollection of events that took place many hours before suspension. In the Penzance Gazette, Feb. 14, 1844, there is the notice of a woman, æt. 40, a servant, who hung herself, and was cut down before life was extinct. After her recovery, she had no recollection that her illness proceeded from an attempt at self-destruction; she thought it arose from a fall down-stairs. She did not remember anything that occurred on the previous day. In the "Times" of July 4th, 1845, also, there is an account of a youth who was charged at the Thames Police-office with attempting to commit suicide by hanging himself, about eleven o'clock on the night of Sunday. When taken into custody on Wednesday night, he professed total forgetfulness of having perpetrated the act; and I have no doubt his forgetfulness was not feigned. He had remained insensible from the time he was cut down until nine o'clock in the morning of Monday. One woman whom I attended through a very severe attack, and saw a month after her labour, had completely forgotten how to write, though she wrote very well before. She could not make a letter without having a copy before her; and when she tried, she looked exactly like a child beginning to learn. Such instances as the foregoing are worth being recorded, not only as physiological facts, but because they may influence our opinions in some medico-legal questions.

[*] The amaurotic affection of the retina, that we meet with both before, as a premonitory symptom, and after, an attack of puerperal convulsions, is rather peculiar. Sometimes the patient, though looking at a candle, or even at the sun, will declare that the room is in total darkness; while at the same time her intellects are unimpaired, and her hearing and general sensations are perfect. At other times she will only see half of an object. I have been told upon four or five occasions, when the woman has recovered her consciousness, that although she could see nothing in the interval of the fits, yet she heard distinctly everything that was said; as though the mischief, whatever it might have been, was entirely local, and the *tubercula quadrigemina* or the *optic commissure* were the only parts of the brain oppressed.

[†] Chap. xvi. sect. 2, note.

there was evidently, after delivery, a greater or less degree of abdominal inflammation; Collins* has found a strong tendency to peritonitis, even where blood had been taken freely; and Gooch† gives a case exemplifying the truth of these observations. Although it has happened to myself to meet with a few instances of peritoneal affection subsequent to puerperal convulsions, the number has not by any means been so great as to impress my mind with the idea that the latter disease had any connexion with the former; nor would it have occurred to me to imagine such a connexion, had the remark not been made by high practical authorities.

Both during the continuance of the convulsive paroxysms, as well as after their cessation, while the patient still remains in a state of imperfect consciousness, it is absolutely necessary that the bladder should be carefully attended to, as it may become inordinately distended, and perhaps serious mischief may ensue.

Hysterical convulsions.—Nervous and irritable women are liable, sometimes during labour, but more particularly under pregnancy, to convulsive fits, much less dangerous in their kind than those that I have just described, which seem not to originate in pressure sustained by the brain, and for the subdual of which such active remedies are not required. In these the spasmodic affection is confined to the muscles of the trunk and extremities, seldom affecting the face: there is not the same strongly marked disturbance of the sensorium, nor the same turgescence of the vessels of the head, nor the same hideousness of aspect.

There is a sensation of globus, palpitation of the heart, and a discharge of flatus on the termination of the fit. The muscles of the back seem to be the principal seat of spasm, so that the trunk is bent backwards, in the form of an arch;—a state of things mentioned both by Dewees‡ and Burns,§ as strongly characteristic of the hysterical kind. Such cases frequently depend on irritation existing in the intestinal canal, and may generally be relieved by brisk purging, the dashing of cold water on the face, and warm frictions, or stimulating applications, to the stomach, abdomen, and back.

Many of the antispasmodic medicines will be found of service in this variety, and an assafœtida injection has sometimes at once cut short the disease.

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* Page 211. He recommends minute doses of tartar emetic, after delivery, as a preventive.

† Op. cit. p. 247. ‡ Parag. 1239. § Page 461.

APOPLEXY UNDER LABOUR, and during the last few weeks of pregnancy, unattended with convulsive action, is sometimes, though very rarely, met with.* The symptoms are those characteristic of the same disease under ordinary states of the system; nor does the case require any other than the common treatment; it may be followed by paralysis.

RUPTURE OF THE UTERUS.

Occasionally the uterus bursts, its structure gives way, and a rent is formed in its substance;—an accident of the most formidable nature, and which, by far most generally, terminates fatally. Rupture of the uterus is certainly a very rare occurrence, but there can be no doubt, both that it has often been the undetected cause of death, and also that, when known to the attendant, it has not unfrequently been concealed, from mistaken feelings of policy.† The rent may take place at any part of the uterine structure—the fundus, the body, the cervix, or the mouth may give way. It varies also considerably in its direction, being sometimes longitudinal, sometimes transverse, and at others oblique. The vagina may be implicated, or it may remain uninjured. The laceration may pass through the whole texture of the organ, and involve both membranes,—an extensive communication being made at once with the abdominal cavity; or the peritoneum may be lacerated, and the parenchyma only slightly torn;‡ one, or generally more, longitudinal cracks, varying in extent, having been formed in the membrane;—or again, a large rent may extend through the inner membrane and the parenchymatous structure, while the peritoneum continues entire, the blood which is effused being pent up below it, and not extravasated into the general cavity of the belly.* It is most usual for the laceration to take place through all the structures at once. The rupture may be instantaneous, or more gradual; a large rent, sufficient to allow the child to escape into the abdomen, may happen in an instant: or a small aperture may first be made, and gradually increased with each return of uterine contraction, until it has acquired a size sufficient to permit the passage of the whole fœtal body out of the uterine into the peritoneal cavity.

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* A case of this kind will be found in the Liverpool Medical Journal, for June, 1834, by Dr. O. Roberts; and another in Cheyne's work on Apoplexy, p. 88, by Dr. Kellie, of Leith. I have only seen one case of apoplexy unattended with convulsions in pregnancy: this was fatal; it was in the sixth month, and was a twin gestation. No case of the same kind during labour has come under my observation.

† Burns (p. 477) states that its frequency has been calculated at one in 940 cases. Out of 68,435 cases, however, delivered by the midwives of the Royal Maternity Charity within the last thirty-one years, partly under my late father's superintendence, but principally under my own, (when an occurrence of the kind could not have happened without our knowledge,) we have only had fourteen instances of rupture of the uterus or vagina, being less than one in every 4887 labours.

‡ This is the rarest variety of uterine laceration; but instances of it may be found recorded by Sir C. Clarke, Transactions of a Soc. for Improvement of Med. and Chirurg. Knowledge, vol. iii. p. 290; by Prof. Davis, Obst. Med. p. 1067; my father, Pract. Obs. case 86, part i. p. 409, case 155 second edition; Mr. Chatto, Med. Gazette, 1832. p. 630; Mr. White, Dublin Journal of Med. and Chem. Science, July, 1834, p. 325; Mr. Partridge, Med. Chirurg. Transactions, vol. xix. p. 72; and in part 1st of the Transactions of the Patholog. Soc. of London, 1846-47, p. 130. These, I believe, are all that are on record.

Causes.—Rupture of the uterus during labour† may be produced by the violence of the uterine efforts themselves—the viscus bursting under its own inordinate action;‡ or it may be the consequence of forcible and improperly conducted attempts to turn, under a shoulder or other presentation; of which sad catastrophe I have unfortunately seen more than one instance;—or again, it may be caused by instruments, in the hands of the ignorant, the careless, or the inconsiderately rash. It is impossible to believe with La Motte,§ Levret,‖ and Crantz,¶ that the struggles or convulsive movements of the child can ever occasion it.

It would appear, however, from statistical reports, that a woman in labour of a hydrokephalic fœtus is eminently liable to become the subject of ruptured uterus; for out of seventy-four instances of congenital hydrokephalus, which Dr. Thomas Keith found on record, and collected for his thesis in 1848, in sixteen the uterus lacerated. Dr. Simpson has related two cases of the same kind, to which he was called, both women having previously borne large families with the usual facility and safety.** Dr. Keating, in the last American edition of this work, gives a case that occurred, in 1854, to Dr. Mason of Philadelphia, where, in a sixth labour, the uterus ruptured; the head was dropsical, and measured six inches in the transverse diameter.* This liability in the uterus to rupture is another reason for the observance of the rule which I have laid down at page 252, of not allowing a patient to remain long in labour without assistance, when it is clearly ascertained that the fœtus is hydrokephalic.

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* See my father's Pract. Obs. case 81, 1st edit., case 152. 2nd edit.; Velpeau, edit. Brux. p. 332; Hamilton, Pract. Obs. p. 376; Davis, p. 1068; and Steidell's first case, Med. Comment. vol. vi. p. 123. Collins (Pract. Obs. p. 244) says, that of thirty-four cases, in nine the peritoneum was not injured. He also says (p. 242), that twenty-three of the children were males; and that of twenty cases mentioned by Dr. M'Keever, fifteen were male children; and accounts for this by remarking, that the heads of males are larger than those of females.

† The uterus may be burst under pregnancy, as any of the other abdominal viscera might be, by force applied from without, such as the being run over by a carriage, and the like accident; but such do not come within the scope of the present observations.

‡ Hamilton (Pract. Obs. p. 378) states that he saw one case in which the uterus ruptured itself under a convulsive fit, and he therefore regards convulsions as an exciting cause; but I do not know any other instance on record of a similar kind; and we cannot but look upon these two occurrences happening together in the same labour as purely accidental.

§ Traité des Accouch. 1765, parag. 596. ‖ L'Art des Accouch. 1761, p. 106.

¶ Commentarius de Rupto in partus doloribus fœtu Utero, 1756, parag. 8. A translation into French of this memoir will be found appended to Puzos, Traité des Accouchemens, 1759, 4to. ** Obst. Mem. p. 653.

This accident may occur to women bearing a first or subsequent children; to the young, as well as those more advanced in life—to the plethoric and the debilitated—to the healthy and the ailing. But out of twenty-two cases which have come under my notice, I have only known two instances in which it happened during a first labour.† It may take place as well under a head, a breech, or a transverse presentation, and at any period of the labour. It has been known to happen at the very commencement of the process, when the os uteri had not acquired a dilatation equal to the diameter of a shilling.‡

Laceration of the uterus is most likely to happen to a patient who has had three or four children, who possesses a slightly distorted pelvis, and who has been in strong labour for a number of hours.

Although the rent may take place in any portion of the organ, its most frequent seat is at the neck, either at the posterior part, opposite the promontory of the sacrum, or anteriorly, behind the symphysis pubis.§ The direction is also mostly transverse, or slightly oblique. It is not difficult to account for this being the most usual situation of the injury; for since, during the latter part of gestation, the neck of the womb rests upon the pelvic brim; if the promontory of the sacrum dip too far forward, or the ridge of the pubes be preternaturally sharp, it is reasonable to suppose that the uterine structure may be affected, that inflammation may occur as a consequence of pressure, and that a thinning or softening of the substance may be induced; and under these circumstances, should the structure give way at all, it is likely that the weakened part will be the first to suffer.*

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* Page 448.

† Out of thirty-four cases noted by Collins, seven occurred in first labours. He states that he was for a long time of opinion that women in labour of a *first* child were rarely liable to this accident; but that experience has convinced him this was an error.—(Pract. Treat. on Mid. p. 305.) Besides these 22 cases of ruptured uterus, I was called to one patient in whom the os and cervix uteri had lacerated longitudinally at the side of the pelvis to a considerable extent;—the child was born living, and the woman recovered also. It was her second labour; and it was believed that in her first the mouth and neck had split in a similar manner.

‡ A preparation of ruptured uterus was once sent to my father, in which the child and membranes had passed into the peritoneal cavity before the os uteri could admit two fingers.—(Pract. Obs. &c. case 84, 1st edit.) Most likely, in this instance, there was disease in the uterine structure—a softening or thinning of texture, for instance, consequent on inflammation; for we cannot suppose that the healthy womb would, by its own powers, lacerate its substance before the membranes of the ovum had given way, and while its mouth was undilated.

§ It is very rarely that the fundus gives way, unless as a consequence of violence inflicted on the body externally; or perhaps from the hand of the attendant in endeavours to turn the child.

Denman, indeed, says that, "independently of disease, the uterus may be worn through mechanically, in long and severe labours, by pressure and attrition between the head of the child and the projecting bones of a distorted pelvis; especially if they be drawn into points, or a sharp edge." † One or other of these causes may explain why we more frequently meet with laceration of the uterus when the pelvis is *slightly* contracted, in the conjugate diameter at the brim, than when the *distortion is excessive.* It must not be forgotten, however, that by a fall, or other accident, the uterus may be so much injured, as to induce a degree of disease that will predispose it to lacerate at that spot where the blow was inflicted, when it takes on itself expulsive action. ‡

Symptoms.—The symptoms of ruptured uterus are strongly characteristic of some violent injury having been sustained; and they may be divided into the local and more general marks. The history of the case will be somewhat of this kind:—

A woman who has probably had children before—who has generally suffered lingering labours—whom we know to possess a small pelvis—and for whose safety we are consequently more than usually solicitous—is to all appearance going on well in labour, having borne, with fortitude and good spirits, a number of strong expulsive pains; when, in the acmé of one of these powerful contractions, she suddenly shrieks, cries out that something has given way within her, and expresses herself as being in violent agony. §

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* See my father's Practical Observations, case 77 of first edition, 147 and also 148 of the second, in confirmation of the idea that the cervix uteri may be thinned during pregnancy, where the pelvis is slightly distorted. In a case of ruptured uterus to which I was called (Oct. 23, 1840), dissection showed that the linea-ileo-pectinea, where it traverses the pubes, was formed into a very sharp ridge, that there were a number of bony prominences jutting from the inner surface of the pubic bones towards the cavity, and one especially, situated above the left thyroid foramen, which was so pointed as to pain the finger when hard pressure was made on it. The sacro-pubic diameter was two inches and three-quarters in extent. It was the woman's second pregnancy; the first child had been delivered by craniotomy. After a consultation held, labour on this occasion was induced in the eighth month by the exhibition of four doses of the ergot. The membranes broke spontaneously, three hours and a half before the accident occurred. I was sent for by the gentleman in attendance immediately after it had happened, and delivered by turning; she died on the night of the fourth day. See Burns, p. 471, 5th edit., for a somewhat similar case. Other cases have also come under my observation, where a sharpness of the ridge of the pelvic brim anteriorly has been the occasion of a laceration of the uterine neck.

† Chap. x. sect. 7, parag. 8.

‡ Perfect relates an instance (case 78) in which a fall, six weeks previously, seemed to be the predisposing cause of rupture during labour.

§ It is said that this rending sensation has been accompanied by a noise distinctly audible to the attendants in the room; but as I was never present when the accident happened, I have no opportunity of verifying or refuting the assertion by my own

From that time, all proper uterine action ceases, or becomes very much impaired.

If an extensive rent be formed at once, the probability is that the labour pains will be instantly suspended; but if it be only slight in the first instance, they will most likely be continued for some little time, though their character will be more feeble, and with each return of contraction there will be an increase in the laceration. Should the pains of parturition entirely cease, their place will be supplied by a new pain, referred to one fixed spot, constant, most agonising, and much more difficult to bear than the throes of labour.

There is seldom observed, consequent upon the accident, a copious hæmorrhage. It might be supposed, *à priori*, as the vessels of the uterus are so large, that when they are torn, blood would be poured out rapidly from their lacerated cavities, as happens when the placenta is partially separated before or after the child's birth. But this is not the case; there is seldom considerable flooding as a consequence of ruptured uterus, and sometimes there is but little or no increase of discharge whatever.* Even should the vessels bleed freely, their contents need not escape externally; for the head of the child may be so blocking up the pelvis, as to prevent the exit of the fluid through the vagina; and it may be effused into the cavity of the abdomen.

On making an examination soon after this new pain is complained of, we shall in most cases find that the head, which could be easily detected at our previous examinations, can now only just be touched, or it may have receded completely out of the reach of the finger, so as to elude our search. This is owing to the admission of the child's body more or less within the peritoneal cavity, through the rent thus accidentally made. We are not, however, to expect this as an universal symptom;—though, when it does occur, it may be considered one of the strongest diagnostic marks we can observe,—because it is not unlikely that the head may have previously become locked in the pelvis, having been forced into the cavity, by the contractions of the uterine fibres; and if it be firmly jammed, it is impossible that it can free itself so as to recede.

Occasionally, then, it will happen that the whole of the child's

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observation. (See Observations on Ruptured Uterus, by Dr. Andrew Douglas, London, 1785, p. 49; also Dewees, parag. 1382; and Perfect's Cases in Mid. vol. ii. p. 60.) Dr. Trask (American Journ. of Med. Sciences, vol. xii. January and April) in an elaborate paper, in which he has collected three hundred and three cases of this accident, says, in one the noise of the laceration was sufficiently loud to "awaken the physician who was taking a nap in the adjoining room."

* Hamilton (Pract. Obs. p. 377) says, according to his observation, that when the rent is transverse, an immense effusion of blood into the cavity of the abdomen follows; but that longitudinal lacerations are not productive of the same effect.

body at once escapes through the rent into the abdominal cavity; nay, the same strong effort that caused the rupture has expelled both child and placenta into the peritoneal sac; and the uterus continuing to contract and diminish its volume, as well as the length of the laceration, they have both been enclosed in a shut cavity, to which there is no sufficient outlet.*

Cases are on record also where the same contraction that caused the rupture has expelled the child into the world.†

Whenever the fœtus has thus escaped more or less out of the uterus into the cavity of the abdomen, its limbs may be traced through the abdominal parietes; the breech, legs, and perhaps the arms, may be felt tolerably distinctly.‡

The symptoms I have just enumerated are particular signs, and belong exclusively to the case we are considering; but there are others of a more general character, which soon take place, and are themselves also highly characteristic of the accident. The general symptoms, indeed, are exactly such as we should expect to meet with in cases of extensive injury to any of the abdominal viscera. The pulse soon flags, it becomes very quick, irregular perhaps, and so feeble as to be scarcely perceptible; the respiration becomes hurried, laboured, and painful; the countenance anxious and dejected; the eyes sunken, dull, and inexpressive; the belly swells rapidly, and almost immediately becomes very tender to the touch. Vomiting of a dark-coloured matter supervenes, sometimes almost instantaneously, sometimes at a later period; there is generally hiccough; the extremities become cold and insensible; a cold sweat breaks out on the face, forehead, neck, and chest; and if delivery be not effected, the patient will almost always gradually sink in a very few hours from the accident.

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* In a case that occurred within the knowledge of my father, the fœtus was expelled into the belly through the rent, and by the same uterine effort the placenta was thrown into the world through the vagina. The midwife's note that summoned my father to this case was very graphic, and informed him at once of the nature of the accident that had occurred. It was in these words,—"Pray come directly, for the child is gone, and the after-birth is come."—(Pract. Obs. part ii. case 217; case 170, second edition.) I was called to a case of ruptured uterus, in which, although the head originally presented, I found on my arrival the breech offering itself. The laceration took place at the cervix, implicating also the vagina, while the head was entirely above the brim; the head and shoulders of the child had escaped through the new-made opening into the abdominal cavity, and the fundus continuing to contract, the breech was forced down into the situation the head had originally occupied; the child's body was thus made to perform an evolution, and the breech passed into the pelvis: from which I extracted it with some difficulty.

† See Burns, p. 470. In a case of recovery after this fearful accident, related by Mr. Currie, of Liverpool (London Med. Gaz. Feb. 27th, 1836), the breech presented, and the laceration took place between the expulsion of that part and the birth of the shoulders. In one case to which I was called, the child was expelled by the uterus subsequently to a laceration having occurred in the posterior part of the cervix.

‡ The being able to trace the fœtal limbs through the parietes of the abdomen, in conjunction with the recession of the head, almost or entirely out of the reach of the finger, is to be regarded as an infallible proof of this dangerous occurrence having taken place.

Prognosis.—Although a laceration of the uterus is to be looked upon as the most dangerous accident that can happen to any of the pelvic viscera during labour, with the exception only of a rupture of the bladder, still it is not to be considered necessarily fatal: many cases of recovery are on record, as those detailed by Heister,[*] Peu,[†] Douglas,[‡] and Kite;[§] but, to name more recent authors, the late Dr. Hamilton[‖] met with one, so did his father.[¶] Madame La Chappelle,[**] Haden,[††] Blundell,[‡‡] Frizell,[§§] Dunn,[‖‖] Currie,[¶¶] Birch,[***] and Smith, of Maidstone,[†††] besides some others, each give us one. Davis,[‡‡‡] Collins,[§§§] M'Keever,[‖‖‖] and Ingleby,[¶¶¶] have noted two; my father saw three;[****] and I have known two. Thus, although the accident must be considered as one of the most formidable character, yet we are not to give up the case as hopeless: we are both authorised, and bound, to make some efforts to preserve the patient.

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[*] Surgery, part ii. sect. 5, cap. xiii. sect. 14. He relates it as communicated to im by Runge, who was a respectable surgeon at Bremen. The intestines were distinctly felt protruding through the rupture into the cavity of the uterus after the child was extracted. Runge kept them back with his hand till the organ was sufficiently contracted to prevent them prolapsing again; and the woman happily recovered.

[†] Pratique des Accouch. 1694, p. 341. In this case the uterus was torn and pierced in several places by violent efforts to deliver; the neck of the bladder was also lacerated.

[‡] Observations on Ruptured Uterus, 1785; case of Mrs. Manning, p. 7.

[§] Mem. Med. Soc. Lond. vol. iv. p. 253.

[‖] Select Cases in Mid. p. 138.

[¶] Outlines of Midwifery, 3rd edit. p. 348, note.

[**] Annuaire Med. Chirurg. tom. i. p. 542.

[††] Trans. of Soc. of Improvement of Med. and Chirurg. Knowledge, vol. ii. p. 181.

[‡‡] Obstetricy, p. 704, note.

[§§] Trans. of King and Queen's Coll. Phys. Dublin, vol. ii. p. 15.

[‖‖] Edinburgh Med. and Surg. Journal, vol. xl. p. 72.

[¶¶] Med. Gazette, Feb. 27th, 1836, p. 854.

[***] Med. Chirurg. Trans. vol. xiii. p. 357.

[†††] Ibid. p. 373.

[‡‡‡] Obst. Med. p. 1070.

[§§§] Pract. Treatise, p. 247.

[‖‖‖] On Laceration of the Womb and Vagina, 1824.

[¶¶¶] Obst. Med. p. 212.

[****] Pract. Obs. part ii. case 207, and two following; cases 170, 171, 172, second edition. All these three women became subsequently pregnant: one of them my father attended twice afterwards in labour; another died of flooding, undelivered, between the sixth and seventh month of gestation. On opening the body there was detected at the anterior part of the uterus a cicatrix, running in an oblique direction, which evidenced the union that had taken place after the rupture. Frizell's patient had one child afterwards; Dunn's had two; so had Lambron's (vide p. 505, note, of this work); and Douglas's, it would appear, had three or four. In the year 1839 I was called to a patient, who, after a very lingering labour, had been delivered of her first child by craniotomy seven hours and a half. An attempt had been made unsuccessfully to remove the placenta. I found the woman much exhausted; the uterus was firm, the placenta wholly within it: on introducing my hand into the vagina, it passed through a rent in the back part, either of the vagina or cervix uteri, into the abdominal cavity. I felt the posterior peritoneal surface of the uterus distinctly, as well as the intestines. I withdrew it, and again introduced it in a different direction, when it entered the uterine cavity. The placenta was strongly and universally adherent. I separated it and took it away with some difficulty. No blood flowed either during or after the operation; nor did any proper lochia appear, but in their place a most fœtid discharge came on, which lasted till the twenty-first day; a portion of putrid, fibrous matter, nearly as large and as thick as a woman's hand, then

Treatment.—There is but one mode of practice, however, that offers the least chance of life—and that is speedy delivery. The instant I knew that the uterus had ruptured, I should proceed to extract the child—provided delivery could be accomplished—as being the most likely way to save the mother, and the only means of preserving the infant.* If the head has entered the pelvis, and has not retreated, so that the long or short forceps can be used, the child may be extracted by their agency. But we generally find that it has receded beyond the reach of that instrument; and we must then introduce the hand into the uterus, follow the child's body through the rent made into the abdomen, if it have escaped, search for the feet, draw it by their means back through the same opening into the cavity of the uterus, and extract it *per vaginam.*† If it should happen that after the breech and shoulders are born, the head remains above the brim, and will not pass in consequence of the contraction of the pelvic bones, we shall be compelled to open it behind the ear, and extract it as I have before directed.‡ The preservation of the child, indeed, is not to be expected, and scarcely to be hoped for, under these circumstances; for in almost every instance of ruptured uterus on record, and in all where I have myself attended, except one, in which natural expulsion took place, the fœtus has been born dead.§ Levret|| insists upon the necessity of cutting through the parietes into the abdominal cavity immediately the event is detected; and Baudelocque¶ thinks, if delivery cannot be perfected by the forceps, that this mode of removing the child is much preferable to extracting it by the vagina. He limits delivery by the feet to those cases where they

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came away,—certainly no part of the placenta,—and the discharge ceased; she was able to leave her bed at the end of the month: five weeks after her confinement she became the subject of melancholia, which at the end of a fortnight disappeared; and she subsequently recovered perfectly. She has, however, not menstruated since; and I understand has lost all sexual desire. Her medical attendant tells me she is occasionally "flighty." Three other women I have delivered who, I expected, might recover, two having lived a week, and one six days.

* "I attribute the successful issue of this case, in a great measure, to the promptness with which the woman was delivered after the accident had occurred."—(Ramsbotham, Pract. Obs. part ii. p. 489; second edition, p. 486.) The recovery of the patient "seems in a great measure to depend on the speedy removal of the child from among the viscera."—(Douglas on Ruptured Uterus, p. 67.) "The author is strongly impressed with the belief that nothing but immediate delivery can save the life of the woman."—(Hamilton, Pract. Obs. p. 383.)

† Of the 21 cases in which I delivered after the uterus was lacerated, one was a breech case, two were transverse presentations, and all except one were extracted by the feet; that child I delivered by the long forceps.

‡ Page 356.

§ Collins states (p. 247) that out of thirty-four children, two were born alive; but this I should look upon as beyond the general average of live births.

|| L'Art des Accouchemens, p. 105.

¶ Parag. 2177, trans.

are found at the os uteri, or where the child remains entirely within the uterine cavity, or where the vagina only is ruptured, the uterus itself being uninjured. I think myself, the British practice superior to that inculcated by Levret and Baudelocque. During the passage of the child from the abdomen through the uterine rent, great care must be taken lest any folds of intestine be brought down with it, and involved in the opening; because, on the uterus contracting, they would necessarily be strangulated, add very much to the present suffering, and dissipate the slight chance of safety still remaining.*

Every circumstance connected with rupture of the uterus is agonising to the utmost extent; the suddenness and awful nature of the accident, the rapid sinking of the vital powers, and the almost certain loss of the infant, all combine to render this a case of most aggravated distress. To these may be added the horrible feeling experienced in the delivery by the feet, upon the hand being introduced into the centre of the abdomen of a living person. Nothing can be more appalling than the sensation communicated by the intestines encircling and coiling round the fingers; but however horrifying the idea, all feelings of repugnance must give way before a sense of duty. It is seldom under laceration of the uterus that the perforator can either be necessary or available as a means of delivery before the body of the fœtus is extracted: for if the head be locked in the pelvis, which is not often the case, the labour may most probably be concluded by the forceps; and if it remain entirely above the brim, it will either have receded out of reach, or will be pushed up on the application of the instrument, sufficient resistance not being afforded to enable us to perforate the cranial bones. This cause of disappointment I have myself in no few instances experienced; and I have found turning, therefore, the operation most generally applicable to this emergency.†

As soon as delivery is effected, a large dose of opium or morphia must be given, the utmost quietude must be observed, everything stimulating—unless the depressed state of the system requires the administration of some cordial—must be avoided, and the restorative powers of nature must be trusted to for the recovery. I know no medicines but those of the soothing kind that are likely to be of service; and no other specific means can be adopted until inflammatory symptoms appear; when the case must be treated upon common principles.

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* In Runge's and Currie's cases, as well as many others on record, the intestines protruded through the laceration into the uterine cavity, and Baudelocque (parag. 2166) informs us that they were actually strangulated in a case that occurred under the hands of M. Percy.

† See a case by Mr. Tovey (Lancet, Dec. 4th, 1841), in which, although the head was on the perineum, the application of the perforator caused it to recede so far, that the hand was obliged to be introduced, and the child turned and delivered by the feet.

But it is not always possible to deliver the patient by the natural passages. The mouth of the womb may be rigid, and not sufficiently dilated to admit of the hand being introduced; but this is rare; or what is more probable,—especially if the rent be in the fundus, or near it,—the uterus may have expelled the child and placenta entirely into the abdomen, and contracted so strongly as to have closed its cavity. Under such a state it would be most injudicious to endeavour to extract the child in the ordinary way, both because of the additional hazard, which must attend on any attempt to gain an entrance into the uterine cavity; and because, even were the hand admitted, the rent through which the child had escaped would be so much diminished in extent by the contraction of the parietes, as to preclude the possibility of bringing the fœtal body again through it without considerably increasing it, and adding to the original danger.

In these perplexing cases, it becomes a point of much nicety to determine whether the patient should be left to the resources which nature may supply, or whether any means should be taken for relieving the abdomen from the presence of the fœtal body.

There are many cases of reputed rupture of the uterus on record, in which the child has been left in the cavity of the abdomen, and has been evacuated in a putrid state by abscess, the woman perfectly recovering. I am far from denying the *possibility* of such a termination to the case; but I should look upon it as most *improbable;* and I cordially coincide with Dewees [*] in the opinion, that almost all these cases have been instances of extra-uterine conception, and not of impregnation of the womb attended with rupture of the organ.[†]

Feeling as I do that to leave the child in the cavity of the belly is almost certain death to the mother, I should seriously entertain the question, whether the parietes of the abdomen should not be divided, and the child extracted by that means, rather than that the patient should be abandoned to the chance of what nature might effect; and the answer must depend entirely on the circumstances of the individual case. If the pulse, breathing, and countenance remained tolerably natural,—if her spirits were not greatly depressed,—if, indeed, she had not suffered so severe a shock as is usual from the accident,—particularly if, after explaining to her what had occurred, she were anxious for the operation to be performed, I should have no hesitation in undertaking it. But if I found her sinking,—if the powers of life were ebbing fast,—and especially if thirty or forty minutes had elapsed since the rupture, and the movements of the fœtus had quite ceased,—I should by no means sanction the incision, because of the painful nature of the operation; and because I should presume it would avail nothing, and might probably hasten her death. Much, then, must be left to the judgment of the practitioner; and his determination must depend entirely on the state of the patient, and the probability of the child's being saved. For its sake, we ought to urge the operation immediately after the accident with greater force than if half an hour or longer had elapsed, because, while there is a chance of its preservation, its welfare must be considered as well as that of the mother; and the introduction of anæsthetic vapours into practice has removed one great objection to the performance of gastrotomy;* but after its death, the mother, of course, would alone interest us.

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[*] Parag. 1361.

[†] The cases of this kind least liable to suspicion, perhaps, are those related by Baudelocque (parag. 2149), when it was believed that the uterus had been ruptured by a fall in the fourth month of pregnancy; after which the fœtus was evacuated by abscess, through the abdominal parietes; and the two given by Davis (p. 1072), which occurred under the notice of Dr. Sims and Mr. Windsor.

Premonitory symptoms.—Generally, laceration of the uterus takes place without any symptoms indicating even the probability of its occurrence; but many premonitory signs have been noted by Crantz,† Levret,‡ Burns,§ Hamilton,‖ Davis,¶ and others, as forerunners of the accident: these are all most unsatisfactory, and, unfortunately, scarcely in the least to be depended on. It would be most desirable, indeed, if some infallible precursor of this dreadful occurrence were discovered, that delivery might be effected before the laceration happened, and thus the peril be averted.

We certainly may fear that laceration will ensue, if the woman possessing a small pelvis has had one or more children; if her previous labours had been lingering, and more than ordinarily painful; if for six or eight hours she have been suffering strong expulsive throes, attended with little or no progress; if she complain of a violent cramp-like pain in one particular part of the uterus, increased under a contraction, but never entirely disappearing, particularly if that should be the spot opposite the promontory of the sacrum, or behind the symphysis pubis.

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* The operation of gastrotomy after rupture of the uterus for the extraction of the infant, has very rarely been performed; but there are the histories of some successful cases on record; thus M. Thibaut Desbois, of Mans, published one in which the mother recovered.—(Journal de Med. vol. iii. p. 448, Mai 1768.) M. Lambron operated in this manner twice on the same woman (Baudelocque, trans. parag. 2180); the last time saving both mother and child. She became pregnant again, and was delivered of a healthy child naturally. In vol. v. of Journal Complémentaire de la Dict. des Sciences Med. p. 189, Dec. 1819, a case of this kind is given, operated on by MM. Bernard, Latouche, and Josset, in which the woman was preserved.

† De Rupto Utero, parag. xiv.

‡ L'Art des Accouch. parag. 598.

§ Mid. p. 492.

‖ Pract. Obs. p. 385.

¶ Obst. Med. p. 1069.

With the presence of such symptoms, I should consider it probable that the uterus had received some injury, and I should fear that if the labour were allowed to go on unassisted, the organ might rupture. Under these circumstances, I think the practitioner would be fully warranted in having recourse to delivery before the woman's powers began to flag, provided the child could be extracted by the forceps, without injury either to itself or its parent.

Though as much averse as any person can be from unnecessary instrumental interference, I have applied the long forceps with great success in some cases where such a state of things was present,—not because the patient was sinking, but because of this fixed and agonising pain,—dreading the possibility of rupture of the uterus.*

I have seldom known a case in which the uterus ruptured, where the attendant was not more or less blamed; and that, as may be gathered from what I have advanced, most unjustly.

LACERATION OF THE VAGINA

is often complicated with rupture of the uterus; but occasionally, the whole of its coats burst, while the uterus remains entire, and the child escapes more or less into the abdominal cavity.†

Such cases are usually attended by symptoms similar to those that accompany rupture of the uterus; they are almost equally dangerous, and are to be treated exactly on the same principles.

But a laceration of some of the fibres of the mucous membrane and muscular coat at the back part of the vagina sometimes takes place, while the head is occupying the pelvis. This is most usual in first labours, when rigidity exists, and the parts dilate with more than ordinary difficulty.

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* Levret, Hamilton, Davis, and others, recommend liberal bleeding when such symptoms arise as they suppose threaten a laceration of the womb; Hamilton and Davis, after venesection, administer full doses of opium. Both these means will be useful to quiet inordinate uterine action; but I should prefer delivery without loss of time, if it could be accomplished safely.

† Laceration of the vagina, to the extent of allowing any part of the child to pass into the peritoneal cavity, is, as far as I have been able to judge, a much rarer accident than rupture of the uterus. But Merriman (Synops. p. 35, note) mentions having seen two cases, each of which was occasioned by the midwife forcibly dragging the child swollen with putrid air into the world; one will be found in the Med. Chirurg. Review, July, 1834, p. 224, transcribed from Siebold's Journal; M'Keever (Med. Chirurg. Review, Dec. 1821, p. 530) met with one; Ross (Annals of Med. vol. iii. p. 277) reports one, after which recovery took place; the woman became again pregnant, and the same accident occurred at the same part of the vagina — she recovered a second time also; and my father gives a case (part i. case 87, 156 of second edition) in which, after death, an extensive laceration of the posterior part of the vagina was discovered communicating with the cavity of the belly, but not implicating the uterus. I was called to a case once, in which the *anterior* part of the vagina had given way below the os uteri, and the child had escaped between the uterus and bladder into the cavity of the belly; both the latter organs remaining uninjured. I should scarcely have supposed it possible for such an accident to occur without one or other of these organs being implicated in the rent, if dissection had not positively convinced me of the fact.

The medical attendant may perhaps be sensible that a laceration has occurred; but it may take place when neither the medical man nor the patient is at all aware of what has happened, the pain which the parts are suffering being but little increased by the fibres giving way. After the birth, inflammation will supervene, the healing process will be established, and in the next labour a small cicatrix may perhaps be felt, which may give the first indication of the previous occurrence.

Treatment.—If the laceration were to a great extent,—if we feared it might run into the rectum, or up to the os uteri, we should hasten the delivery of the child by the forceps, provided that instrument could be used with advantage; but if it were trifling, the labour must be allowed to proceed in the natural way, the rent being carefully watched; and the perineum must be most assiduously supported, as soon as the head comes to rest upon it. After the labour is completed, a poultice may be applied: and if there be no contra-indicating symptoms, a full dose of opium may be given; and the bowels should be early relieved.

RUPTURE OF THE BLADDER.

A more fatal accident even than rupture of the uterus, is the bursting of the bladder during labour, and the evacuation of its contents into the peritoneal sac.* It appears to me that this accident must always be the effect of neglect or improper interference; it very seldom indeed, or never, can occur in the hands of a careful and judicious surgeon. The kidneys under lingering labour rarely secrete the same quantity of urine in the same space of time as they are accustomed to do in the ordinary states of the system, because much of the fluids is carried off by perspiration; and the secretions of the skin and urinary organs are in a great degree vicarious; but at the same time the action of these organs is by no means suspended; a certain quantity of urine is constantly distilling through the ureters, and the bladder becomes at length distended. If this distension is allowed to proceed beyond a certain point, it will burst, and the case becomes perfectly hopeless.

The rash or careless employment of instruments under a distended state may also cause laceration. If the forceps be applied while the bladder is full, the action of the instrument is very likely to occasion it to give way; and for this reason I have before particularly inculcated the necessity of thoroughly evacuating this viscus before any attempts at delivery are made.

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* This accident is fortunately very rare; but two cases to which my father was called will be found detailed in part i. of his Pract. Obs. cases 89 and 90, first edition; 158 and 159 of the second.

Symptoms.—When laceration of the bladder has taken place, the symptoms are exceedingly distressing and strongly marked; they are very much like those characterising a rupture of the uterus; the recession of the child, however, the being able to trace its limbs through the abdominal parietes, and any increase of discharge through the vagina, being wanting:—they are, the appearance of a sudden and violent pain in the region of the bladder, accompanied with a shriek, and often also with a declaration by the patient that something has burst within her; a rapid sinking of the powers of life; a general tumefaction, and great tenderness of the abdomen. The labour-pains—which usually cease on a rupture of the uterus—continue for an uncertain time, till they decline as a consequence of exhausted powers. The particular symptoms present in this case, and absent in rupture of the uterus, are, a loss of the vesical tumour which before could be felt distending the abdominal parietes, and in its stead a more diffused swelling of the belly, combined with some degree of fluctuation.

Since rupture of the bladder is so universally fatal, and since it can usually be prevented if proper attention be paid, it becomes our duty, under lingering labour particularly, to keep a watchful eye over its condition; and if it become immoderately full, to relieve it by the catheter. It is possible, however, that the urethra may be a little turned to one or other side, out of its regular straight course, by the pressure of the head, and difficulty may be experienced in introducing a silver instrument; if such an impediment should exist, it must not be overcome by force, but a flexible male catheter must be used instead.

It has never occurred to me to meet with a case in which it was necessary to puncture the bladder during labour, owing to an inability to introduce the catheter: but such may doubtless possibly occur; and if so, the puncture should be made immediately above the symphysis pubis, in the hope that the peritoneum, drawn up by the rising of the bladder from the pelvis, may escape injury.

Treatment.—Regarding this accident as unavoidably fatal, and considering that the woman will most certainly die, I think that our principal care should be directed to the preservation of the child, and to the endeavour to extract it by the forceps, or by turning before it has ceased to live.

If there were indications of its being still alive, I should consider the use of the perforator in most cases unjustifiable, and it would become a question whether, if no means of delivery *per vias naturales* could be resorted to, compatible with its safety, the Cæsarean section should not be performed.

Such a mode of delivery, however, should never be contemplated while the woman's powers remain at all vigorous, or the uterine contractions continue active; for so long there is a chance both of the child's life being preserved in utero, and also of the labour being terminated naturally.

The death of the child, when it does occur, is dependent on the exhausted state of the mother's system, and not upon any destroying influence existing within its own person.

The child, then, having been extracted, although our solicitude for the mother's preservation be wrought up to the highest pitch, I fear any further efforts to save her will be fruitless and disappointing. I cannot coincide with a great authority in this city, who has suggested the possibility of opening the abdominal cavity, sponging out the extravasated urine, cleansing the peritoneum, by ablutions of warm water, drawing up the bladder, placing a ligature around the lacerated opening, and hoping for a successful issue.* I would prefer abandoning the woman to her fate, certain and fearful as it is, to attempting such a means of prolonging her existence; upon the principle, that I would rather sit quietly at her side, and watch her gradually sink by the hand of nature, than myself be the instrument of hastening her end.

SYNCOPE NOT PRODUCED BY HÆMORRHAGE OR LACERATION OF THE GENITAL ORGANS.

Both during and after labour, women occasionally become the subjects of syncope, unconnected either with hæmorrhage or laceration of any of the organs more immediately concerned in parturition. In women of a delicate habit, nervous and hysterical slight faintings under the first stage of labour are by no means uncommon; and in the higher ranks of life, therefore, such complications are most frequently observed. They are also not unusually met with in the abodes of poverty, where a want of proper ventilation and sufficient nourishment combines, perhaps, with an habitual use of ardent spirits, to destroy the vigour of the system, and incapacitate it from bearing up against the exertion attendant upon labour. Such cases require but little consideration; the vital powers must be sustained at a certain point by the stimulus either of warmth, fresh air, easily digestible nutriment, or by the judicious use of wine, spirits, ether, or ammonia.

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* See Blundell's Obstet. by Castle, p. 479.

If organic disease exist in any of the viscera, particularly those of the thorax, sudden death may take place, consequent on the violent struggles attendant on the expulsive pains; an aneurism, or an abscess, may burst; or the heart may be choked, or its action otherwise impeded.*

But a more simple cause of syncope after the child's birth, independently of hæmorrhage, consists in the collapse consequent on the rapid abstraction of that pressure from the abdominal viscera and large vessels of the trunk, to which they had been so long accustomed. When treating of artificial delivery under placental presentations, I referred to this sudden change in the relative situation of the contents of that cavity, as adding, in no small degree, to the danger of the case; and I have known faintness and death occur quickly after the process of labour had been naturally completed, when there was no hæmorrhage to account for the fatal result, and when dissection neither discovered any organic disease, nor threw the least light on the immediate cause of dissolution.

Such attacks of syncope most frequently follow rapid labours; and patients of a relaxed fibre, whose minds possess a gloomy turn,—especially those who have entertained deeply-rooted apprehensions with regard to their recovery,—are most usually the subjects of this dangerous affection. My father states, that it is observed more frequently when the child is still-born, and refers it partly to despondency, the consequence of such an aggravated disappointment.* The liberal admission of fresh air, placing the head and shoulders rather below the level of the other parts of the body, the exhibition of repeated small doses of stimuli, the application of warmth to the extremities, abdominal friction, and especially the adaptation of a properly contrived broad bandage, girt tightly round the person, seem to offer the most effectual means of restoring the tone of the circulating system.

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* I was once requested to be present at the inspection of the body of a woman, about forty years old, who had died suddenly in labour of her first child. She ha been for seven years subject to great difficulty of breathing, with cough, which ha latterly increased, and the sputum had been occasionally streaked with blood. Some hours after the membranes had ruptured, while standing by the bedside, during a uterine contraction, she seized hold of her attendant's arm, and, without uttering a expression, she fell on the floor dead. On opening the body, we found in the tw cavities of the pleuræ nearly three pints of serum; the lungs, independently of thei compressed state, were healthy; the pericardium also contained a considerabl quantity of fluid.

On another occasion I was requested by an old pupil to assist him in investigatin the cause of death in a patient, aged twenty-eight, who suddenly expired immediatel after having given birth to her fourth child. She had been for three or four years subject to violent palpitations, and much difficulty of breathing, on the least exertion, over walking slowly up stairs; she had constant cough, and occasionally expectorate small quantities of blood. My friend was not called until the os uteri was entirel dilated; the labour was unusually easy; the child was born an hour after he entere the room; and the same pain which expelled the breech, also threw off the placenta She appeared not to have suffered much from fatigue, and inquired concerning th sex of the child. While, however, her attendant was tying the funis, he observe that she was attacked with a slight convulsion; and before he could get round to th side of the bed near which her head lay, she had ceased to breathe. The uterus wa firmly contracted, and contained a very small quantity of coagula; the viscera of th abdomen were remarkably healthy; the lungs were healthy in structure, but gorge with blood; the heart was small, and very flaccid; the mitral valve was muc thickened, and the communication between the left auricle and ventricle would onl just admit the end of the little finger. There were about five ounces of serum in th pericardium. These cases would teach us to watch a patient narrowly under labou in whom there had previously existed any symptoms of organic disease, either of th heart, the lungs, or, indeed, of any other organ connected with the respiratory o circulating systems.

PROLAPSUS OF THE FUNIS UMBILICALIS

by the side of the head (Plate 80) or breech, sometimes occurs during labour. The loop, however, cannot descend until after the membranes have ruptured; and usually it passes down the moment the liquor amnii is evacuated. The longer the cord is, the more likely is this accident to happen; and should it have gravitated to the os uteri, and collected there in a fold, it is scarcely possible to prevent the coil being carried down into the vagina by the rush of the escaping fluid.

Such an occurrence brings with it not the least danger to the mother;—the labour goes on as well as if it had not happened; for since the space occupied by the fallen funis is most inconsiderable, it cannot impede the regular advance of the process. But the child must always be placed in greater or less jeopardy; the peril is generally extreme, and entirely dependent on pressure. Since the life of the fœtus is sustained by the circulation through the cord, any interruption to the free passage of the blood must produce hazard; and if it be suspended for any length of time continuously, death will ensue, as surely as if breathing were prevented after birth;† and it therefore becomes a matter of great moment that we should adopt some plan for its preservation. Not that it is absolutely necessary the fœtus should perish because the funis prolapses; but the chances are much against its being born living, unless means are taken to protect it.‡

Diagnosis.—There will be no difficulty in detecting the cord hanging in the vagina. By its softness, smoothness, and roundness, and particularly by its pulsation, should the fœtal circulation be still carried on,—it may be distinguished both from any part of the child, as well as from any of the maternal structures.

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* Pract. Obs. part i. p. 207, first edition; 116 of the second.

† Mauriceau (Maladies des Femmes Grosses, livre ii. chap. xxvi.) supposed the exposure of the funis to the cold air occasioned the child's death; but this is evidently erroneous.

‡ Collins (p. 346) states, that out of ninety-seven cases of prolapsed funis which occurred in the Dublin Lying-in Hospital during his mastership, twenty-four children were born alive; and of sixty-six during Dr. Clarke's, seventeen were born alive.

Treatment.—If the pulsation have entirely ceased for some time,—especially if the cord be external, and have become cold and flaccid,—there can remain no doubt of the child's death. The continuance of the fold in the vagina is, under such circumstances, of no importance; and the labour may be allowed to proceed uninterfered with. But if the arteries be still beating, whether in a natural manner, or more feebly, it is right that we should attempt to guard the vein as well as them from the pressure which they must more or less experience before the birth is perfected.

With this intention, four methods have been proposed:—carrying the prolapsed cord to that part of the pelvis where there is most room, and where it will be most out of the way of injury;—turning the child, and delivering by the feet;—returning the funis within the uterus, and keeping it above the presenting part until the fœtus is partly in the world;—and delivering by the forceps as early as is practicable.

It will seldom be possible to preserve the funis from pressure by carrying it to one or other side of the pelvis; for the volume of the fœtal head is so nearly adapted to the capacity of the pelvic cavity, as to leave but little space unoccupied. This mode of proceeding, then, is very unsatisfactory, because but of partial benefit; and in few cases can it be trusted to. Turning the child, and delivering by the feet, has received the sanction of most obstetrical authorities of the present day, provided the presence of the funis at the os uteri be discovered before the membranes break, or it prolapse while the head remains floating, as it were, entirely above the brim: the os uteri being in a dilated or easily dilatable condition. Thus Denman* counsels us, "If the child be living, and the presenting part remain high up in the pelvis,—especially if the pains have been slow and feeble,—it will generally be better to pass the hand into the uterus, to turn and deliver by the feet, using, at the same time, the precaution of carrying up the descended funis, that it may be out of the way of compression." But he afterwards utters a sentiment which would render the instruction just quoted almost a dead letter, in these words: "No attempts to save the child are on any account to be made, but such as can be practised without *the chance* of injuring the mother."†

Burns‡ says, "As soon as the os uteri will admit the introduction of the hand, the child should be turned;" but if the presentation be advanced before we are called, he recommends

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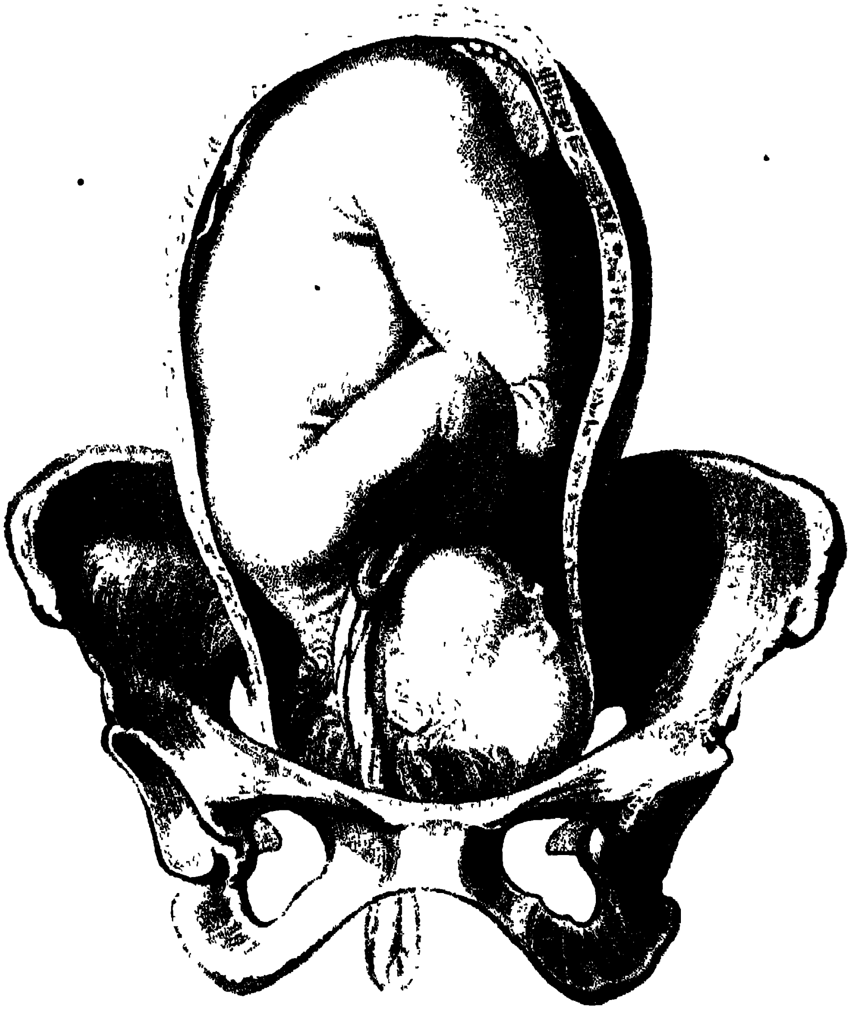
* Chap xviii. sect. 3.

† Sect. 4.

‡ Princip. of Mid. p. 388.



"removing the cord to that part of the pelvis where it is least apt to be compressed;" or, what is still better, pushing it above the head, because "this is less violent, and safer, than attempts to turn in an advanced stage of labour." Dewees[*] tells us, if the cord prolapses, turning may be had recourse to:—1st, When the uterus is sufficiently dilated or dilatable for the operation; 2nd, When the head is still inclosed in the uterus; 3rd, When there is no deformity of pelvis to defeat the object of the operation." Gooch,[†] after premising that we are not justified in adopting any measure which will endanger the life of the mother, adds, "If we detect a presentation of the funis when the os uteri is nearly dilated, the membranes entire, and the parts in a relaxed state, no one would here hesitate to turn and deliver, as it may be done with ease and safety." Campbell[‡] thinks, that, "of all the methods proposed for managing these cases when the passages are prepared, or when the labour is not too far advanced, turning is decidedly the most proper; but this practice is not unexceptionable." Hamilton[§] supposes we are bound to turn, if we detect a presentation of the funis before the membranes rupture; but that we are not warranted in doing it afterwards.

I have thought it right to cite the opinions of these eminent practitioners at length, because they are at variance with my own, and because I wish to put the case as fairly before the student as I can. No argument that I have ever heard has inclined me to adopt their practice as a general principle; and I perfectly agree with Baudelocque,[||] that, "although the accident is dangerous, the precept of delivering instantly, by turning the child, if adhered to indiscriminately, is not less so." He advises, that nothing should be done until we ascertain what course nature is likely to take, and the degree of compression the umbilical cord is suffering; for he thinks that the natural expulsion is often more rapid than the extraction could be. Conquest[¶] seems adverse to turning under these circumstances; nor does Blundell[**] nor Collins[††] sanction the practice. Merriman[‡‡] states that turning can only be resorted to under a combination of the four following circumstances:—pulsation in the cord, proving the life of the child; its head not having yet entered the pelvis; the pains not being strong; and there existing a relaxed state of the external parts, to admit of the ready extrication of the head; and, indeed, if delivery by this means is ever undertaken, Merriman's judicious rules should be rigidly adhered to. I would even venture to add,

[*] System of Mid. p. 262.

[†] Compend. p. 239.

[‡] System of Mid. p. 320.

[§] MS. Lect. 1821.

[||] Parag. 1122, transl.

[¶] Outlines, 1837, p. 135.

[**] Obst. by Castle, p. 610.

[††] Pract. Treatise, p. 344.

[‡‡] Synopsis, p. 96.

that under this favourable state of things, no man would be justified in terminating the labour manually, unless he had acquired by practice some experience in the operative department of his profession.

The objections which I take to this mode of proceeding depend partly on the hazard in which the mother must be involved under every case of turning, however favourable the attendant circumstances, and however skilfully the operation is performed; and partly on the danger which the child must suffer from compression of the umbilical cord itself during the passage of its shoulders and head through the pelvis; and this danger will be extreme, if the pelvis be of small dimensions, or the soft parts preternaturally rigid.

The practice I would recommend for the adoption of the young surgeon, provided the subsidence of the funis at the os uteri be discovered before the membranes break, is to keep the patient perfectly quiet in one posture,—to prevent her moving off the bed, to caution her strongly against exerting her voluntary efforts,—not to leave the chamber on any account,—and to be most careful in preserving the bag of membranes perfect. The moment it has ruptured, to introduce two or three fingers of the left hand, or the whole hand, if necessary, into the vagina,—to carry the loop up above the presenting part of the head,—and to retain it there until the next pain comes on, in the hope that the head will be propelled somewhat downwards, while the funis remains above. Should it, however, again descend, another attempt may be made; the fingers need not be withdrawn until two or three pains have been suffered, and it is quite probable that the head will then have passed down so low as to preclude the likelihood of the cord again prolapsing. We shall often, however, be disappointed by the loop re-appearing as soon as we remove our fingers: if that should be the case after the cord has been returned, a small piece of soft sponge, as advised by Hogben* and Hopkins,† may be introduced, to act as a stay on which it may rest. This mode of proceeding I have two or three times found efficacious; and both Gooch and Blundell have succeeded in saving the child by such means.

Mauriceau ‡ did not overlook this cause of danger to the fœtus, and he recommended that the descending loop should be passed up by the end of the fingers; and if it would not remain above the head, but descended again as soon as the hand was removed, that a piece of soft linen should be introduced on which it might rest; that another piece of linen steeped in warm wine should be carried up to the mouth of the womb, to prevent the funis becoming chilled; and if these means do not succeed in preserving the cord above the head, to turn the child with great care, and deliver by the feet, provided that operation could be accomplished without endangering the mother. Dr. Colin Mackenzie * wrapped the prolapsed fold in a leathern purse, with a mouth that closed by a running string; and carried both within the uterus together. This last method possesses no superiority over the piece of sponge; and it is not impossible that the vessels of the funis might be so compressed by their envelope as to suspend the flow of blood through them. The late Sir Richard Croft, knowing the difficulty of preserving the coil of cord above the head, advised that it should be carried by the hand into the uterus, and suspended on a limb, which would effectually prevent its future descent. He published two cases, † in which he practised this method successfully, and informed Dr. Denman that he had also met with others equally fortunate. His suggestion, however, has not been generally followed; and I cannot myself recommend it, because of the difficulty of accomplishing the object, and because there must always be some risk to the mother in the introduction of the hand within the uterus. The passing the hand into the uterine cavity, indeed, is never to be adopted without grave occasion, and a tolerable certainty of being able to accomplish the end for which it was undertaken.

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* Obstetric Studies, p. 62.

† Accoucheur's *Vade-Mecum*, p. 193.

‡ Livre ii. chap. xxvi.

Many mechanical means have been invented for the purpose of returning the funis into the uterus after it has once prolapsed, and retaining it there, above the head of the child, out of the way of pressure. Some of these are ingenious enough; but most of them are complicated. It is impossible that we should be able to carry constantly with us any instrument only designed for the purpose under consideration; and indeed, when we regard the rarity of this accident, ‡ to do so would appear absurd: on the other hand, the occurrence is likely to have compromised the child's life before we could obtain an instrument from home. If, therefore, we can manufacture for ourselves on the spur of the moment an efficient, extemporaneous contrivance, simple, and of easy application, it is evident that a material and valuable point will be gained. This I think we may always do. We shall only require a piece of thin whalebone, from eight to twelve inches long, and half an inch wide, and less than a yard of narrow tape; both which may be obtained wherever women are present. Near one end of the whalebone two holes should be bored about an inch asunder; the tape should be carried through first one, and then the other; so that the loop should lie lengthwise on the

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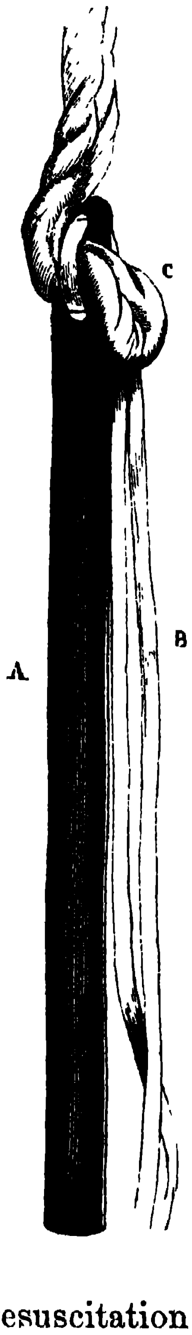
* Denman, loco citato.

† London Med. Journ. 1786, p. 38.

‡ Churchill, Oper. Mid. p. 284, gives the average at 1 in every 276¾ cases.

whalebone, between the holes, and both strings should hang down on the same side. When used, the fold of funis must be placed within the loop, and the tape drawn moderately tight,—not sufficiently so, however, to impede the circulation through the umbilical vessels;—and the end of the instrument thus charged must be carried up into the uterus above the child's head; the tape must then be taken away, by pulling at that half of the string which is passed through the lower hole, the funis released, and the whalebone withdrawn. If the fold comes down again, it may again be returned, and the instrument may be left for some little time just within the os uteri, where from its form and pliability, it is not likely to do any injury.* A knot may be made at the extremity of that piece of the tape which is to be pulled down, to distinguish it from the other.



Annexed is a diagram of this kind of instrument:—A, the whalebone. B, the two portions of the tape. C, the fold of funis loosely fixed in the loop.

Should the membranes have broken some time before the patient is first seen, the same means will avail, if the head be still above the pelvic brim. But if it have descended within the scope either of the long or the short forceps, and the pulsations in the umbilical arteries are quick, weak, and intermittent (particularly if they should be suspended during each uterine contraction), while the progress of the labour is slow, one or other of these instruments may be employed to facilitate the birth.† In their application, however, we must be extremely careful that the funis is not pinched between the head and the blade,—else we shall run into the very danger we seek to avoid, and our interference will be highly injurious, instead of useful. The extraction must be as rapid as is consistent with the mother's safety.

It is always desirable, when the funis descends, to inform the patient's friends of the great probability there is that the child may be born still, and to require that the common means for its resuscitation should be in readiness on its expulsion; and if she herself is inquisitive about the extraordinary attention we think it necessary to pay her, we may candidly confess to her that the navel-string has fallen down: and add, that the accident does not in the least endanger her safety, but that our solicitude is for the preservation of her babe.

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* For this idea I am indebted to Mr. Samuel Steele Perkins, of Exeter, who was kind enough to furnish me with it in the year 1843.

† All the authorities I have mentioned advise delivery by the forceps if the head is in the pelvis, the labour progressing slowly, and the soft parts relaxed.

If the funis prolapse by the side of the breech, if it be found impossible to keep it within the uterus, and the vessels be suffering compression—traction, by passing a finger, the loop of a handkerchief, or a blunt hook around the thigh, may be made to terminate the labour more speedily; and if it pass down while the child lies transversely, turning must be had recourse to; the operation being undertaken, not because the cord descends, but because of the unfortunate situation of the infant.

DESCENT OF THE HAND BY THE SIDE OF THE HEAD OR BREECH

is another complication of labour, by no means so serious as the case last considered, but which occasionally is productive of much embarrassment. One hand only may prolapse (plate 81), or both may at the same time descend. It is owing to the original position of the fœtus in utero. I have already shown that the most usual situation of the arms is their being crossed upon the chest: but that sometimes one, and occasionally both, are placed against an ear: and when this is the case, on the evacuation of the liquor amnii a descent of the limb is very likely to take place.

Though not dangerous to the life either of the mother or her offspring, this accident is in a degree unfortunate for both;—for the mother, because the hand occupies a certain quantity of space, and may therefore proportionably retard the labour;—for the fœtus, because the pressure on the cartilaginous structure of the wrist may so injure the limb as to be of serious eventual consequence; and this especially if both prolapse. I have not myself, however, in any case seen much injury result.

It is not difficult to detect the hand at the brim of the pelvis, even before the membranes break. There is no part of the body with which it is likely to be confounded, except the foot; and the marks I have enumerated* will, if borne in mind, be sufficient to distinguish the one limb from the other.

Treatment.—I have before directed that, whenever the hand was detected at the os uteri, an accurate examination should be made to determine, as soon as possible, whether the shoulder was above; or whether the head or some other part was presenting; because our treatment entirely depends on the information we then acquire. Thus, if the shoulder present, or the fœtus lie otherwise transversely, turning must be had recourse to, which operation is not necessary if either the head or the breech offer themselves to the finger. Should the case prove such as we are now considering, our duty is to keep the prolapsed limb above the presenting part, that as little impediment as possible may exist to the easy expulsion of the fœtus. With this view, on the rupture of the membranes, the fœtal hand may be embraced between the two first fingers of our left hand, and returned without force or violence within the os uteri: it may there be kep until two or three pains have propelled the head sufficiently down to preclude the probability of a fresh descent; and I have in numerous instances, even when the hand was lying low in the vagina, succeeded in returning it with a facility far beyond my expectation. If we withdraw our fingers immediately we have passed it up, the next pain will probably again protrude it, and we may find it requisite to return it many times. Should we be foiled in keeping it out of the way in this manner, a piece o sponge may be used, as recommended when the funis prolapses and if it gives us continued trouble, rather than irritate the vagina or os uteri, we had better allow it to remain down, and take the chance of its being slightly swollen.* It is not necessary to deliver instrumentally, merely because the hand is in the vagina; but if the pelvis be narrow in its diameter, and especially if both hands are protruded, so much room may be occupied by them as materially to interfere with the easy passage of the head and such symptoms of exhaustion may possibly be induced as will require the application of instruments, to terminate th labour.

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* Page 364.

I am perfectly persuaded that most of those cases which w sometimes hear of, where the fœtal hand presented in the vagina and it was supposed that the shoulder had been raised, and th head brought to the pelvic brim, have been mistaken; and that th child did not originally lie transversely; but that the presentatio was the hand by the side of the head. I have myself more tha once heard the ease with which this evolution could be effecte mentioned, and the superiority of this mode of *turning* over tha commonly practised,—and which, indeed, I have recommended,—strongly insisted on; and I have always suspected some error i the diagnosis: for I know by experience how difficult it is to pus up the shoulder, and bring the head to the os uteri, when th membranes have been some time ruptured.

By referring to plate 81, it will be perceived how easily simple case, such as I am now describing, might be converte

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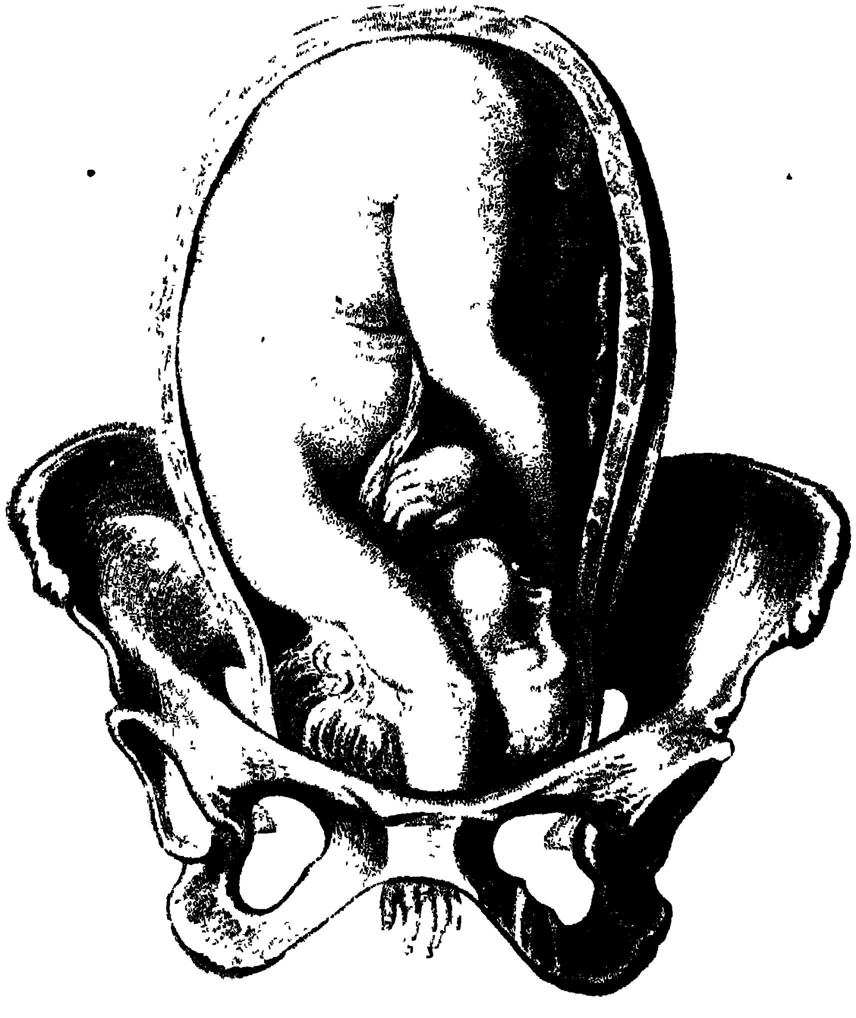
* Barlow (Essays, p. 407) thinks that, even if both hands protrude, it is better no to interfere, but to allow them to pass by the side of the head.



into one of the most difficult in obstetric surgery; for if the hand be brought fully down, so as to appear externally, under the supposition, for instance, that it was a foot, the head will very likely be canted over one ilium, the shoulder and chest will be impacted in the brim of the pelvis, and a transverse presentation will be formed, which will require the introduction of the hand, and the version of the fœtus, before the labour can be completed: and this should be an extra warning to us perfectly to assure ourselves of the position of the child before we interfere by traction at a limb.

UNUSUAL QUANTITY OF LIQUOR AMNII.

The presence of an excessive quantity of liquor amnii will sometimes retard the process in the first stage; though this is certainly a rare cause of lingering labour. It is looked upon as a dropsy of the amnion. Sometimes this inordinate secretion commences at the early period of pregnancy; more frequently not until after some months have passed; and probably about the time of quickening. It is generally combined with dropsical symptoms, either ascites or anasarca; and very frequently the child is dropsical also. The uterus has been known to contain many quarts of fluid.* When this preternatural distension is the cause of lingering labour, it may be known by the size which the woman has attained, by the pains being weak and ineffective, by the cervix uteri being largely developed, and, after the os uteri has begun to open, by there evidently being a large quantity of fluid between the finger and the presenting part of the fœtus. The ballotement, should the head present, is also very distinctly marked, even before labour has commenced. Whenever this state is known to exist, the membranes should be ruptured; the uterus will then collapse around the body of the child, its powers, which had been hitherto fruitlessly expended, will be directed into a serviceable channel, and the case will make proportionably rapid progress.

Labour, indeed, generally in this kind of case comes on prematurely, and sometimes it is necessary to induce it artificially, by letting off the liquor amnii before the term is completed. This should be done in all instances if the patient's breathing be greatly embarrassed, or her life be brought into any jeopardy: for her safety is not to be put into competition with the preservation of a child, so often under these circumstances born either dead or diseased.†

The diagnosis of dropsy of the amnion, before labour has begun, is sometimes very difficult, especially if it be combined with ascites. When there is a large quantity of fluid present within the uterus, there will be a distinct sensation of fluctuation, which may lead to the belief either that the case is one of abdominal or ovarian dropsy; and unless great pains be taken in our investigation, the mistake that is likely to arise might end in the most disastrous results. The best means to clear up the difficulty is by an examination per vaginam; we shall then find the cervix considerably developed and expanded, a sense of propulsion will be communicated to the finger, if placed against the uterine neck, on making percussion on the abdomen with the other hand; and the ballotement of the fœtus will be clearly perceptible, especially if we place the woman in the upright posture.*

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* See Lee's Clinical Midwifery, cases 166, 168, 171 (in which there were ten quarts), and 172.

† Lee's Clin. Mid. pp. 94 and 96.

It is scarcely worth while to enter here into the causes of this morbid condition. Some have referred it to the maternal system, and others to diseased action originating in the fœtal; that there generally exists with it a strong disposition to the effusion of water into the different cavities of the mother's body cannot be denied; but when unconnected with a dropsical condition of the mother, I quite accord with Dr. Lee in the opinion, that it must be merely considered as one of the numerous diseases of the fœtus, and its appendages, which have as yet baffled all pathological investigation.

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* In the summer of 1843, a patient of the Maternity Charity placed herself under my care, supposing she was about seven months advanced in pregnancy, and anxious about herself in consequence of her enormous size, which had been steadily and rapidly increasing. From fluctuation being so very perceptible I doubted the existence of pregnancy, but as she was suffering in no other way, except from her unusual bulk, I did not think it necessary to prescribe any decided plan of treatment then. I continued to see her frequently for six weeks, during which interval she was still enlarging. When she became somewhat incommoded in her breathing, I made a vaginal examination, and clearly detected that the uterus was gravid. I then determined on puncturing the membranes, provided any more urgent symptoms arose. The next evening, however, labour came on, the midwife was sent for at ten o'clock, remained with her all night, and called me to her assistance at seven o'clock in the morning. I found that the pains had been feeble and ineffectual, though distressing, that the os uteri was dilated to the size of half-a-crown, and that there was evidently a very large accumulation of liquor amnii—the head presenting. I ruptured the membranes; and we collected in a pail more than a gallon of fluid, besides fully half that quantity that was lost. The pains immediately became more powerful, and she was delivered in less than an hour and a half. She was about eight months and a half advanced. The child was alive, but its abdomen, as well as all its limbs, was filled with serum. It never cried, was very livid in the face, and died in a few hours. As the parents were of the Jewish persuasion, I could not obtain leave to inspect it, but I have no doubt that the chest was full of fluid also. The mother's legs were œdematous, but beyond that she had no symptoms of dropsy.

I should mention, that in the first edition of this work I did not introduce excess of liquor amnii as a complication of labour, rendering it embarrassing or lingering; the case related above, however, and two or three others similar that I had seen after this book first came out, induced me to do so on the publication of the second.

MONSTERS.

The development of those irregular formations termed Monsters offers many curious objects for physiological speculation, and some of interest also to the practical obstetrician: in both of these points of view, therefore, the subject deserves from us a little consideration.

Varieties.—The word, in itself not perhaps the most appropriate that could be chosen, has very improperly been applied to the subjects of disease, such as appears occasionally in after life. Thus the hydrokephalic fœtus is by some considered as a *monster.* If used at all, however, it should strictly be confined to those instances in which some great deviation from normal structure is observed, either as the result of original natural formation, confusion of the organs of two separate children, or irregular or diseased action of a specific kind, such as can only exist in, and influence the organisation of, the fœtus in utero. Buffon's arrangement is the most simple, as well as natural. He divides these productions into four varieties:—1st, those in which there is a deficiency of parts; 2nd, those which are redundant in organs; 3rd, where the parts are mis-shapen; and 4th, where, although the organs may be naturally formed, they are mis-placed. (*See* Appendix M.—MONSTROSITIES.)

Treatment.—In regard to the management of these anomalous cases, which is the chief point of interest to the obstetrical surgeon, I have little to offer. It is very possible we might be deceived, in mistaking the presentation of the head of an anenkephalic child for some other part; or we might be quite at a loss to make out what it was. Under such circumstances, as accurate an examination as possible of all the body within reach should be instituted, and probably one or other of the facial features might be felt which would lead us to a correct diagnosis. If the fœtus be deficient in the size of any part, or in its members, without a correspondent enlargement of bulk in other organs, no interference can be required, provided the pains be strong, and the pelvis sufficiently roomy: but if it be double (plates 82 and 83), or excessive in development, the common principles before laid down must guide us. The varieties of monstrous formations in excess are so many and diversified, that it is utterly impossible to lay down rules to meet all exigencies. The conduct of the case, therefore, must be left entirely to the judgment of the practitioner; and the welfare of his patient will depend on the correctness of the views he has formed of natural and instrumental delivery, and on the dexterity he may have acquired by practice.

PLURAL BIRTHS.

Women, although usually uniparient, like other uniparient animals, sometimes produce more than one offspring at a birth; and when the gestation is plural, twins are by far the most frequent.*

It is popularly supposed that climate, and the state of civilisation to which the country has advanced, exert an influence on the multiplication of the human species; and that certain external circumstances are favourable or otherwise to the frequent production of twins; but this is by no means proved; although we know that some animals, the sow for instance, farrow more young at a birth, and also more frequently, when domesticated, than when in a state of nature.† Dewees‡ says, that if the various tables can be relied on, it is certain "there are conditions and circumstances which give rise to more double births" in America than Europe; while Collins§ remarks, "It is singular that in Ireland the proportional number of women giving birth to twins is nearly a third greater than in any other country from which I have been able to obtain authentic records."||

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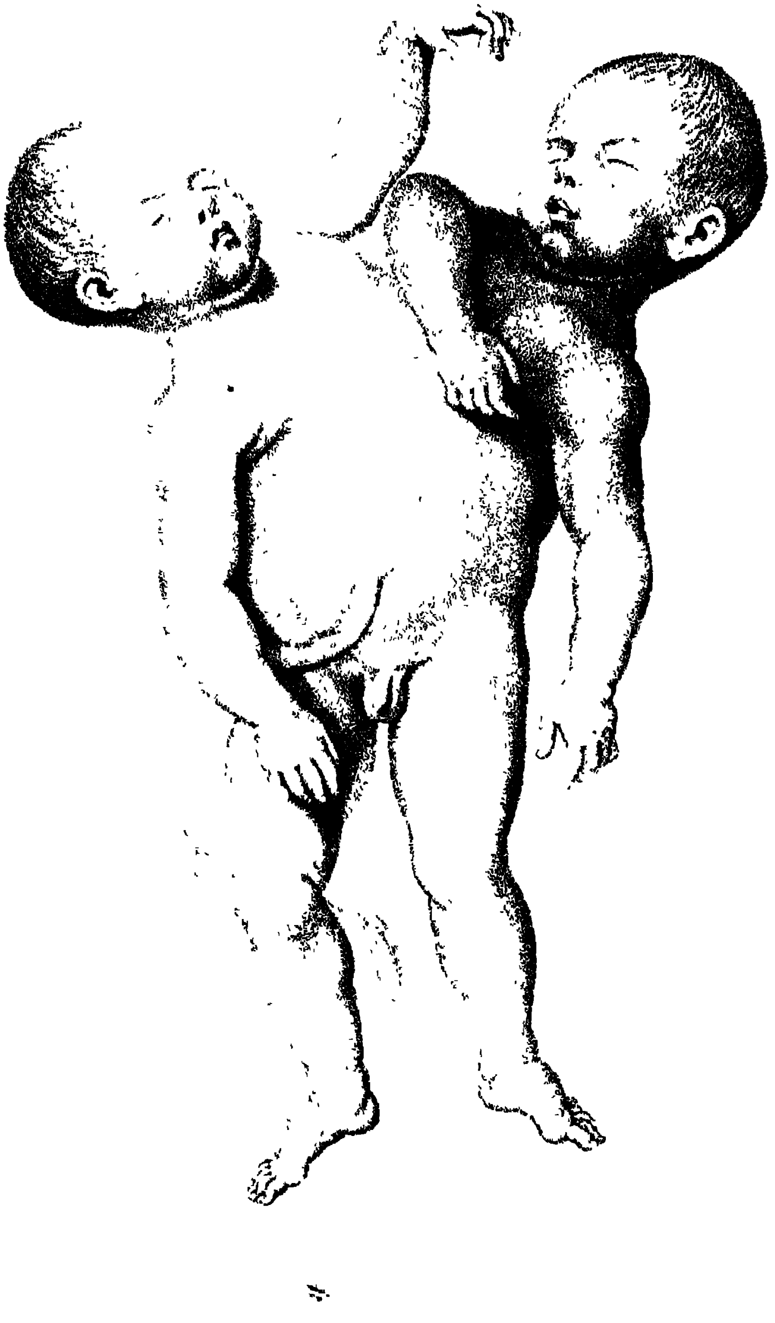
* The average of twin cases varies considerably in different parts of the world; and we find also no little difference in the tables kept by separate individuals in the same country. Thus Denman shows that in the Middlesex Hospital in this metropolis, one occurred in about every 95 labours; in the London practice of midwifery the estimate is stated as one in 48; Conquest considers it one in 90; Gooch, one in about 70; Blundell states, that from the statistical accounts transmitted to Government in the year 1801, it appeared that, in these islands, one in 65 was a twin case. Bland in London, and Boer at Vienna, found the average one in 80; in the Maternity at Paris, one was met with in 88; in the Maison d'Accouchemens, one in 91; Mad. Boivin met with one only in every 132; Dewees averages the frequency in North America as one in 75; Dr. Arnell's average is also one in 75; Mr. Moore's, one in 76. From Collins's table, of 129,172 women, delivered in the Dublin Lying-in Hospital, there were 2062 cases of twins, being one in about every 62 labours; 29 of triplets, or one in 4450; and one of quadruplets. From tables which I have myself kept, I find that out of 48,996 cases that occurred in the Royal Maternity Charity, from January 1st, 1828, to December 31st, 1851, there were 536 instances of twins, or one in nearly every 91½ labours. (See Appendix P.) Of these 182 were of different sexes; 171 were both boys; and 183 both girls;—253 of these children presented both with the head; 215 the head and breech, or lower extremities; 42, both breech or lower extremities; 19, one head, one transversely; 5, one breech, the other transversely; in one, both presented transversely; and in one case the first child presented with the foot, and the second with the head, hand, and foot. It is curious, too, that when the children were of different sexes they mostly presented with the head and breech. It is generally supposed that triplets are to be met with once in about 4 or 5000 labours; and if we took the returns from Dublin only as our guide, we should be led to believe that estimate tolerably correct; but I am inclined to think the frequency of these cases generally much overrated; for out of the 48,996 there were but three cases of triplets. These averages necessarily differ somewhat from those published in the second edition of this work, which were taken from 35,743 cases. Quadruple cases are so rare, as to defy anything like an accurate calculation.

† See page 50 of this work.

‡ Parag. 1321.

§ Pract. Treatise, p. 309.

|| I have heard these two opinions, apparently contradictory, attempted to be



It is also a belief that preternatural fecundity is, to a certain extent, hereditary; and Dewees states, that "some facts within his own knowledge would seem to countenance this supposition; but they are not sufficiently numerous or strong to confirm it." He looks upon it, however, as in some instances constitutional, and adduces the case of a woman, whom he knew, that five times produced twins, and never had a single child; and another who thrice brought forth twins, though not consecutively.[*]

It has been observed, indeed, that some seasons appear more prolific than others, as well in the human race as other productions of nature; but whether this is quite accidental, or dependent on some fixed laws, is not easily determined. Denman thinks "it can scarcely be doubted that there is some relation in those years between the animal and vegetable creation."

Rare as instances of quadruplets are, the prolific powers of the human female are not even limited to the production of four children at a birth. In the Museum of the College of Surgeons in this city, there are five fœtuses preserved, which were expelled at one birth, under the care of the late Dr. Hull of Manchester; they had advanced to five months' intra-uterine age.[†] For other instances of five children at a birth, *see* Appendix N.

In the London Practice of Midwifery, which is a copy of the late Dr. John Clarke's lectures, and some other works on the science, it is stated that Dr. Osborn met with six distinct ova thrown off at one abortion.[‡]

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reconciled by the explanation that a large proportion of the first European emigrants to America were from the Emerald Isle. Denman, too, (chap. xvii. sect. 1) thinks climate and the state or degree of civilisation have their influence over the fecundity of human beings.

[*] Gottlob mentions one "who blessed her husband with eleven children in three births."—(Elliotson's Notes to Blumenbach, p. 487.)

[†] When there is more than one fœtus in utero, each is generally smaller than in single births; and in proportion to the number will the size of the children be less. Thus Dr. Joseph Clarke's estimate of the weight of twins is twelve pounds and a half the pair. We often remark, also, that in twin gestations one fœtus at birth is sensibly smaller than the other. Should the uterus contain more children than two, the woman seldom carries them to the full term, and they are consequently rarely reared. The only instance with which I am acquainted of three children at a birth growing up to manhood is in the case of two highly esteemed members of our profession, practising in partnership, and residing a few miles from London, whose trin brother is a clergyman in Wales. They all enjoy excellent health, and are capable of going through a great quantity of hard work. On the subject of plurality, a curious and learned paper by Garthshore, Philosophical Trans. vol. lxxvii. p. 344, June, 1787, may be consulted.

[‡] My father, who was a pupil of Dr. Osborn's, and on terms of close friendship with him, told me that he had no recollection of ever having heard him mention such a circumstance. But in the MS. notes of Drs. Osborn and Clarke's lectures, taken by my father, which some time since came into my possession, I find the following short mention of this:—"Dr. Osborn knew a lady who miscarried of six children." Paré (lib. xxv. chap. 3) tells us, that in his day the wife of the Lord of Maldemeure, in the parish of Sceaux, near Chambelly, produced six children at a birth, after which she died; and that the then present Lord of Maldemeure was the only surviving one.

Twins may possibly proceed both from one ovarium, or the rudiments of one fœtus may be furnished by each gland. When the conception, however, is more than duplex, it is clear that one ovary must supply two; for no instance has yet been met with, where these organs were in excess. It is commonly supposed that twins are the result of one connexion; and instances are noted where this must have been the case. But it is not equally plain that this is an universal rule; and it appears to me by no means impossible that a second impregnation may take place soon after a former one has occurred. It is not difficult, indeed, to imagine that such an event may happen at any time previously to the uterus becoming lined with the secretion afterwards converted into the deciduous membrane; or until its mouth is plugged with that viscid mucus which divides its cavity from that of the vagina, and which, after its formation, would entirely prevent the immission of the seminal fluid *in coitu.**

His history of this extraordinary occurrence is so circumstantial, as to impress us with the belief that he was himself fully convinced of the fact. It would be going too far, perhaps, to say that such an event was impossible: but we must take into account that Paré, though an honest man, and an excellent surgeon for his time, was a very credulous philosopher.

* Cases are recorded that bear upon this point. The celebrated one related by Buffon, for example (Nat. Hist. vol. ii. p. 433, trans.) A white woman at Charlestown, South Carolina, was delivered, in 1714, of two children, one black and the other white;—this difference in colour led to an inquiry, and she confessed that on a particular day, immediately after her husband had left his bed, a negro entered her room, and threatening to murder her if she did not consent, forced her to submit to his will. Dr. Moseley has recorded another instance somewhat similar (Tropical Diseases, p. 111); it occurred within his own knowledge on Shortwood Estate, Jamaica. A negro woman brought forth at a birth two children of the same size, one of which was a negro and the other a mulatto. On being questioned, she admitted that a white man belonging to the estate came into her hut one morning, before she was up, and she suffered his embraces, almost immediately after her black husband had left her. Another perfectly similar to the last in every respect is given by M. de Boillon (Bulletin de la Faculté et de la Société de Médicine, 1821). Dr. Dewees (Philadelph. Med. Museum, vol. i.) has related that a servant in Montgomery county was delivered of a black and white child at one birth, which were often seen by the doctor. He states, also, that on the report of her pregnancy, both a black and white man disappeared from the neighbourhood; and Elliotson (Notes to Blumenbach, p. 485) has put on record that Mr. Blackaller of Weybridge sent him the following account:—A white woman of very loose character left her husband, and sometime afterwards returned pregnant to the parish, and was delivered in the workhouse of twins; one of which, says Mr. Blackaller, "was born of a darker colour than I have usually observed the infants of the negroes in the West Indies to be; the hair quite black, with the woolly appearance usual to them, with flat nose and thick lips; the other had all the appearances common to white children." Another case of the same kind is given by Dr. A. F. Attaway, in the Southern Medical and Surgical Journal, for June, 1854. A white woman, the mother of three children, gave birth to twins on the 16th of January, an interval of an hour intervening between their births. The first was very dark, and had every appearance of being of African paternity; the second had very light-coloured hair, a fair skin, and blue eyes. The contrast was very striking as the children grew. The woman, on being questioned, acknowledged having had connexion with a white man five days after her last menstruation, and three days afterwards with a black man also. This is the only time she could have

Each individual child which the uterus contains, according to the law of nature, is distinctly enveloped in its own membranes,—so that its body is not in contact with that of its brother,—it possesses also its own quantity of liquor amnii, and has a separate funis and separate placenta,—the circulations not inosculating. Generally, the placentæ are attached together at a part of their edges (plate 28, fig. 1); and often, on regarding the maternal face, they appear but one mass; at other times they are situated distantly from each other, at different points of the uterus; again, occasionally, though very rarely, the vessels of the one child anastomose with those of the other. It has been remarked that both children have lain in one bag of membranes; and cases are recorded, where the placenta was in all respects single, and the funis also arose singly, and divided into two branches when about to terminate in the umbilicus of each fœtus.*

Symptoms of twin gestation.—There are no symptoms by which we can tell during pregnancy that the patient is the subject of a plural gestation. Some have been noted and dwelt upon as diagnostic marks, but they are all more or less fallacious. Such are, the uterus being of a larger size than usual; but this may depend on an increased quantity of liquor amnii;—the woman feeling two distinct movements at different parts of the uterus; but the sensations of a pregnant patient on this point, as expressed by her, are scarcely ever to be relied upon;—an irregularity in the shape of

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been impregnated by the black man; but intercourse with the white man took place at different times during the month following her last menstruation.—(See Med. Times and Gazette, Aug. 19th, 1854.) That these respective twins were not the offspring of one father is very evident; and a second impregnation, therefore, must have taken place: but we have proof in two, at least, that the connexions followed each other quickly, before any changes could have been commenced in the uterus. In regard to the others the interval seems to have been longer, as far as we can judge. With such histories before us, we are warranted in believing that, in the case of a woman living with her husband, twins may be the result of two separate connexions, if only a short period intervened between them. The possibility of this occurrence did not escape the ancients; for we read in Pliny (lib. vii. cap. xi.) "Ubi paululum temporis inter duos conceptus intercessit, utrumque [puerperium] perfertur. Ut in eâ apparuit quæ gemino partu, *alterum marito similem, alterumque adulterio genuit.* Item in Proconnesiâ ancillâ, *quæ ejusdem dici coitu, alterum domino similem, alterum procuratori ejus.*"

In regard to multiparient animals, whose uteri are cornuated, it is a well-known fact that more than one connexion may be fruitful, if they follow each other within a short time. Thus, if a bitch, while in heat, receives two or three dogs of various species in succession, she may bring forth mongrel puppies of different kinds, some partaking of the characters of one dog, and others of the rest.

* See page 79, note; also a case by Dr. H. Davis (Med. Gazette, May 14th, 1841, p. 307), of three children at a birth, in which two of them lay in one bag of membranes; though the circulations did not inosculate. Also, another (May 28th, 1841, p. 384) very similar, by Mr. Dodd, of Northampton. In the same periodical, for June 11th, 1841, there is a case of five at a birth, given by Mr. Wardleworth, in which three of the umbilical cords arose from the placentæ by one common origin; and the other two cords by another. The three umbilical veins united to form one; and it would seem that there were but five umbilical arteries.

the womb; its being broader than common, or measuring more laterally than in the longitudinal direction; but this again may be the consequence of a transverse position of the fœtus, or an irregularity in the development of the uterine fibres themselves. If, indeed, it should happen that the organ was divided into nearly equal portions, by a sulcus running longitudinally downwards from the fundus to the cervix, we might suspect a twin gestation with some confidence. Collins,* Kennedy,† Montgomery,‡ and other practitioners who have given their attention to auscultation, as a means of distinguishing pregnancy, inform us, that they have detected twins in utero by the double pulsation of the fœtal hearts. This means of diagnosis can only be available to those who have acquired considerable tact in the use of this instrument; and even then the pulsation in the arteries of a preternaturally long funis, detected at a distance from the situation, at which the fœtal heart is heard, might be mistaken for evidence of the presence of another child. Fortunately, such knowledge is not required for the purpose of regulating our practice; for although we might be assured of the gestation being plural before labour commenced, our treatment would not be in the least degree influenced by our discovery.

It is therefore much better, on all accounts, for a medical man not to hazard an opinion that the patient is carrying twins in her uterus, however strongly he may be impressed himself with that idea; not only because she will be alarmed and rendered anxious by the declaration; but also, because he may be deceived in his prediction; since there exist so many sources of fallacy.

Position in utero.—The two children may each be placed in utero in all the varieties of position which one may occupy. It is generally believed that the most frequent presentation is the head of one and breech of the other, as depicted in plate 81; but from my own tables I should conclude it was more usual for both the heads to offer themselves downwards.§ Campbell,|| also, states, that from a register of his cases, "he finds both fœtuses have almost always presented the vertex."

Progress of labour and treatment.—Twin labour generally proceeds exactly in the same manner as though there was but one child. The pains increase in frequency and strength, the membranes protrude through the os uteri, and in process of time burst; but the uterine contractions are often more feeble than when the womb contains but one; and they do not seem so effective, since the upper ovum being interposed between the contracting fibres of the fundus and the fœtus which is presenting, the orga must necessarily expend fruitlessly no small portion of its power. No interference, however, is necessary, solely on that account; and, provided nothing untoward happens, the labour must be allowed to proceed uninterruptedly, until after the first child s expelled; when, for the first time,—although we might have had our suspicions before,—we become positively certain of the existence of a second.

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* Pract. Treatise, p. 310. † On Pregnancy and Auscultation, p. 129.

‡ On the Signs and Symptoms of Pregnancy, p. 126.

§ See page 522, note. || System of Midwifery, p. 293.

I have already advised, that in all cases the hand of the attendant should be placed on the abdomen as soon as the funis is divided, to ascertain the state of the uterus and placenta, and to earn whether there be a second child; if so the womb will be found still large,—its fundus rising to the umbilicus, or above it,—and occupying a space apparently almost as great as before the birth of the first. We may detect, also, that degree of elasticity and subdued fluctuation,—if the membranes be still whole,—which are so characteristic of the uterus at full time. This simple examination will generally be sufficient to inform us of the fact; should any doubt, however, remain, the finger must be passed up to the os uteri, and the membranes of the second fœtus will be felt protruding, as during the first stage of natural labour.

It is possible, however, that we may be deceived both in the external and internal examination. The uterus may contain, besides the placenta, a large quantity of coagula, which may so distend its cavity, that the organ may occupy the principal part of the abdomen; but it will be softer than when another child remains; and, on pressure being applied, blood will most likely be squeezed through the vagina. Again, a collection of blood behind the membranes of the retained placenta may be mistaken for the unbroken cyst of a second child. The case will be rendered clear on lacerating them; for coagula and fluid blood will escape instead of liquor amnii.

As soon as we have satisfied ourselves that the case is plural, it is our duty to determine the presentation of the second child as speedily as possible; and if it be transverse, to turn, as in ordinary cases, according to the rules already sufficiently detailed. But if the head or breech be presenting, the membranes may be ruptured immediately, that an opportunity may be given for the depending part to pass at once into the pelvis. There cannot be the same necessity for preserving the bag of membranes of a second fœtus entire that exists in single births, because the passages have been sufficiently prepared, by the exit of the first, to allow the easy transit of the second, if the children are nearly of the same size; and this proceeding frequently excites the uterus to increased energy, and facilitates the termination of the case.

It will occasionally happen, indeed, that the two children are expelled so rapidly, one after the other, as scarcely to give time for an internal examination to be instituted between their births; and it has occurred to me more than once to find a second child in the world before the one already born could be separated.

If the uterine contractions be tolerably powerful, the birth of a second twin is very seldom protracted, unless it be misplaced in utero, monstrous in formation, or much larger in size than the one first expelled. It is not unlikely, however, that twins may exist with a deformed pelvis, and both may require to be extracted, either by the forceps, or craniotomy instruments.* Women, then, seldom suffer much during the birth of a second twin. As the principal pains under ordinary labour are those of dilatation, and the sufferings generally in proportion to the resistance experienced, we should naturally expect that the second child would be born without either any great effort or much additional painful sensation. But when a woman, after having given birth to one child, learns that there is another still in utero, she for the most part becomes not only apprehensive for her safety, but also fearful that she has to undergo a repetition of the agonies she has just endured; and such an impression on her mind may possible interfere with the due continuance of uterine action. For this reason, it is better neither to inform her abruptly of the nature of the case, nor to make any mystery about it; but calmly to tell her that she will soon give birth to a second; and this may be coupled with a congratulation on the fortunate progress of the labour so far; and an assurance that she will have but little more pain to bear, and that the case presents no features calling for anxiety.

In the conduct of a common twin case, it is of the greatest consequence that no attempt should be made to remove the placenta of the first child until after the birth of the second, and that we should not make any traction at the cut funis which is hanging out of the vagina; for, if we separate the placenta from its uterine attachment, flooding will almost certainly supervene, and the loss of blood may be so great as to require the immediate evacuation of the uterus,—the only likely means by which the hæmorrhage can be restrained.

Upon the expulsion of the second child, the uterus must be again examined, both externally and per vaginam, to ascertain that there is not a third, the birth of which (should there be another) is to be conducted exactly on the same principles; so likewise with regard to a fourth and fifth; for any practitioner may possibly meet with one of these prodigious instances of fecundity.

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* Denman (chap. xvii. sect. 3) remarks, "If we were compelled to make the first labour artificial, it might be necessary or expedient to deliver the patient of her second on the same principle, unless the natural efforts should be efficaciously made soon after the birth of her first child." This, as a general principle of action, will perhaps be found the most frequently applicable; but there must exist numerous exceptions.

In every case of plural gestation, there is considerably greater danger—particularly from hæmorrhage—than when the birth is single: and this arises partly from the increased size which the uterus has acquired, and its indisposition to contract thoroughly;—partly from the larger number of vascular orifices exposed on the separation of the placentæ;—and partly from the greater chance of adhesion having taken place at some part of the more extended surface in apposition to the uterus. Our principal attention should therefore be directed to preventing or subduing flooding. With this view, the uterus should be stimulated to throw off the placentæ by the grasping pressure of the hand, and the utmost care must be taken that both these masses pass from the cavity at, or nearly at, the same time.* Compression on the uterine tumour, then, must be used more diligently than in common labours; and on examining internally, to ascertain whether the placentæ be separated and lying loose in the vagina, one of the funes must be twisted round two or three fingers of the left hand, and brought to its bearing, while the index of the right is carried to the brim of the pelvis; and afterwards, the other must be treated in the same way. No attempt must, on any account, be made to extract them through the agency of the cords, until the beds of both can be most distinctly felt, and the principal part of their bulk surrounded by the finger, introduced as in a common examination; but when they have descended sufficiently low to be entirely encompassed,—each funis having been put slightly on the stretch,—traction may be made by both together, and the organs removed from the vagina, with the cautions before sufficiently, I trust, insisted on. Should flooding supervene after the birth of both children, or a full hour have elapsed, although there may be no hæmorrhage, the hand must be introduced, and the placentæ withdrawn; should adhesion exist, the separation must be conducted on the common principles—care being taken not to remove either until both are fully in our grasp. The uterus must be stimulated to continued contraction by pressure, and the application of cold and astringents if necessary; and the case must be treated as one of ordinary hæmorrhage. On the withdrawal of the placentæ, it is always desirable that the maternal face should be inspected, to assure ourselves that no part remains within the womb.

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* Sometimes one of the placentæ will pass away while the second child remains in utero, without any serious hæmorrhage being produced, and Collins (p. 312) mentions four cases of this kind that happened under his own eye. But this is unusual, and the practice recommended in the text is that inculcated by all modern authors.

Not only, however, is there a greater chance of hæmorrhage occurring in twin labours; but women who have conceived of twins are more obnoxious to many other sources of danger than those bearing a single child. Convulsions, for instance, are comparatively more frequent in plural gestations; and the same remark applies to uterine congestion, and inflammation; to peritonitis, and other inflammatory fevers of the puerperal state; so that the danger accompanying twin births is much augmented from many causes.*

I need scarcely warn my reader, that if flooding, convulsions, or other dangerous symptoms, show themselves between the birth of the two children, the ordinary methods must be used to combat them, and the delivery of the second must be undertaken as speedily as is consistent with safety. But there is a point admitting of some dispute, and deserving of very grave consideration—namely, the length of time that it would be desirable to wait, after the birth of the first child, before means are taken to extract the second; no dangerous symptoms appearing in the interval. Some practitioners decry artificial assistance, merely in consequence of lapse of time, and found their arguments on the very excellent obstetrical maxim, that Nature should never be interfered with, or thwarted in her intentions, so long as she can be safely trusted. The consequence of this doctrine is, that often many hours, sometimes many days, have been allowed to pass, after the birth of one child, before the labour was terminated. This is a practice that I cannot sanction, because of the danger to which the woman must be more or less subjected during the interval; and because of the anxiety, uncertainty, and alarm, that must necessarily harass her mind until she is relieved: nor is it by any means improbable that such depressing feelings may materially interfere with her ultimate recovery. I therefore perfectly concur with Denman in thinking, that if uterine action is not re-established, some limit should be placed to our passive treatment, and that the time which "it may be expedient to wait shall neither be so short as to run the risk of injuring the patient by hurry or rashness, nor so long as to increase the danger, should any exist, nor the difficulty of delivering the patient, if we should be at length obliged to use art for this purpose." And I think the period specified by the same estimable physician—four hours,—perhaps the least objectionable.† I have already advised that the membranes should be ruptured immediately after the birth of the first child, provided the head or breech of the second presents; and the possibility of being compelled to deliver artificially does not militate against this practice; for if the uterus act vigorously, the fœtus will most likely pass naturally; if on the contrary the pains are feeble, or deficient, there can exist little or no impediment to the introduction of the hand and the performance of turning, should the head offer at the brim: and this is the operation, indeed, which we shall find most usually called for, when it becomes necessary to terminate the labour by art. When the birth of the second child is retarded by inertia, a dose or two of the ergot may sometimes be prescribed, in the hope that its influence over the uterus will occasion such efficient action as to render any manual interference unnecessary; but if the specified time have elapsed, and our expectations be disappointed, we should not delay resorting to more certain means of finishing the delivery. These recommendations, however, must only be understood as applying to twin labours, at the full period of gestation. If one fœtus be thrown off prematurely, and another be retained in the womb, it would be unwise to rupture the membranes, or extract manually—unless, indeed, the immediate preservation of the mother required the emptying of the cavity;—because it is not improbable that gestation might be carried on for the perfection of the one remaining; and it would be our duty to save it, even at the sacrifice of inflicting much personal inconvenience on the mother, or at the chance of some small risk to her.

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* Collins, Pract. Treatise, p. 313; Burns, Mid. 5th edit. p. 391; Blundell's Obstetricy, p. 678.

† Chap. xvii. sect. 3. Collins, p. 311, thinks it not wise to wait beyond two hours.

Cases have been known, indeed, where one fœtus and placenta have both been expelled prematurely, and the other retained and carried until the completion of the period of gestation; and this without the patient suffering any dangerous loss of blood.

It is seldom that the membranes of both ova break before the first child is expelled, but such cases are occasionally met with, and instances are recorded in which parts of two separate children descended into the pelvis together. Thus Dr. Ferguson,* of Dublin, relates a case in which the head of one child and the feet of another presented at the same time. The midwife in attendance, before he arrived, had pulled down the feet, and jammed the breech and head together. The pains being very powerful, the labour was terminated naturally; the child whose head presented being expelled first, the other afterwards. A case very similar is related by Mr. James Alexander, jun.† Mr. Allan‡ gives us another, in which the heads of two children occupied the pelvis together (the body of one being in the world), and both were expelled simultaneously by uterine contraction. Mr. Eton, of Windsor, has reported one,[*] in which, after the body of one child had been turned, in consequence of a transverse presentation, the head of a second child came down into the pelvis, and prevented that of the first passing. As the child whose body was in the world was dead, Mr. Eton decapitated it, allowed the head to recede into the uterus, and delivered the other by the forceps; it also was born dead. The woman had an attack of pelvic inflammation, with inability to pass urine, for more than a month after delivery; but eventually recovered.

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* Dublin Med. Trans. vol. i. p. 146.

† Edinburgh Med. and Surg. Journal, January, 1822.

‡ Med. Chirurg. Transactions, vol. xii. p. 366. He refers to another, also of the same kind, in the Journal de Méd. for Nov. 1771.

I was on one occasion sent for to the assistance of a midwife who had been pulling at two feet, which I found external to the vulva. Although they were a right and a left, I immediately detected, by the direction of the toes, that they belonged to different bodies; by gently pushing up one, and careful traction at the other leg, I extricated each breech from the brim of the pelvis, and both children were born living.

SECONDARY FŒTUS.—SUPERFŒTATION.

As connected with twin gestation, the expulsion of what is styled a *secondary fœtus* is worthy of observation. It sometimes happens that, after the birth of a living child at full time, a smaller ovum, or a dead embryo,[†] flattened, or otherwise disfigured, is thrown off, of an age evidently much less than the mature infant;[‡] and this circumstance has led to the belief that *superfœtation* may occur in the human subject; or, in other words, that a second impregnation may take place, while the uterus already contains one ovum.[§]

I have already quoted some cases,[||] in which two connexions, following each other within a short time, were both prolific; and these may therefore be considered as true instances of superfœtation; but in such there is no doubt that the woman conceived of the second before the first ovum had entered the uterine cavity; before the formation of the deciduous membrane; and before the mouth and neck of the uterus were plugged by the tough gelatine, secreted by the *glandulæ Nabothi*. It is impossible to suppose that a subsequent impregnation can occur while one fœtus of four,

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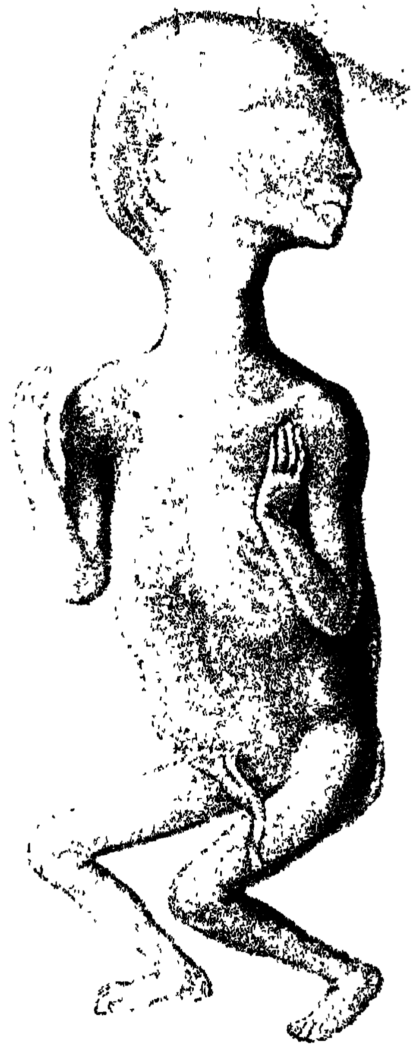
[*] Med. Gaz. July 24th, 1846, p. 152.

[†] Plate 85 represents "a secondary fœtus" of three months' age, flattened in the manner described in the text.

[‡] Pliny (lib. vii. cap. xi.) has noticed this occurrence in the following passage:—"Et in aliâ [apparuit] *quæ unum* [fœtum] *justo partu, quinque mensium alterum edidit.*"

[§] Haller's Outlines of Physiology, chap. xxxi. parag. 929. "Nos vidimus superfœtationem quandoque fuisse epidemicam affectionem." Musa Brassavolus, Comment. ad Aphorism. 38, lib. v. p. 817.

[||] Page 524.



five, or six months' growth occupies the uterus. The gelatinous secretion which completely seals the mouth, as well as the decidua lining the cavity, would prevent the possibility of such a fresh conception taking place.

The phenomenon to which I allude is easily explained upon the supposition that the patient originally conceived of twins; that one lost its life early in gestation, either from some cause influencing the mother's system, or from some defect of structure or diseased action inherent in itself; and that the process of gestation was carried on for the benefit of the live fœtus, till they were both expelled together, or nearly at the same time, at the full period of pregnancy. The only difficulty attached to this solution is, that these secondary fœtuses, although invariably dead, are often perfectly fresh, bearing about them no marks of putrefaction. But this [illegible] be explained by their never-having been in contact with the external air; or perhaps it may be accounted for by the powerful vital principle, which is resident in the gravid uterus, and which is in fervid operation for the purpose of bringing to perfection the living being it contains, protecting the dead mass from the ordinary changes of decay; and acting as an antiseptic power.*

Generally the secondary fœtus is expelled from the uterus, either with the placenta of the living child, as in the case related in the note, or soon after; but occasionally some hours or even days have elapsed; and one instance came to my knowledge, in which the attendant was much blamed; it having been reported that the woman was left with a second child in the womb, while it was supposed that the labour was terminated. This "second child" was a blighted fœtus of about five months' age, and was expelled by uterine action, about thirty hours after the mature infant.

Thus such an occurrence may give rise to much undeserved censure; and the medical attendant should be prepared to afford a direct explanation of the circumstance, whether the blighted fœtus passes immediately on the birth of its twin brother, or at some considerable interval after. A body of this kind occupies so small a space, that its presence in utero could scarcely be detected by the hand externally applied. The uterus may, indeed, feel larger than it should do, and hard; but the same sensation would be communicated by a coagulum detained within its cavity; and until it escapes, I know of no means to distinguish the one mass from the other.

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* A lady whom I had attended in labour three or four times, being caught in a smart summer shower, when about four months advanced in pregnancy, ran quickly home; she was soon seized with uterine hæmorrhage, followed by slight uterine contractions and some limpid discharge. I fully expected she would abort; but to my surprise the symptoms gradually gave way to rest, and other appropriate treatment; and she went on to her full period. She bore a living child, and at the same time with the placenta, there was expelled a dead, and somewhat flattened fœtus, of about four months' age, attached by the funis to an after-birth of appropriate size. There is no doubt that the exertion she made caused a partial separation of one of the placentæ, that the membranes of the same ovum were ruptured, probably by the contractions, and that the waters escaped. The death of that embryo necessarily took place; but the principle of vitality was so strong within the uterus, that gestation was continued for the sake of the living fœtus that it contained; and the mature child and dead embryo were expelled nearly together. The pressure they must be subjected to, between the growing ovum and the walls of the uterus, if the waters surrounding them are discharged, will account for the flattened state in which these secondary fœtuses are generally seen.

I have just said that it would appear impossible for a woman to conceive of a second ovum, while the uterus already contains one.* But some cases are reported, which, on a superficial view, would lead to the belief that such an occurrence might happen. Thus Maton has put on record,† that a lady was delivered on Nov. 12, 1807, of a boy, which was strong and hearty, and on the 2nd of February, 1808 (not quite *three calendar months* from the preceding date), of another boy, also at full time. And Desgranges‡ has reported another of a very extraordinary kind. A woman brought forth a living child at seven months, on January 20, 1780; but no milk was secreted, no lochia flowed, and the size of the abdomen was scarcely at all diminished. Dr. Desgranges was called, in consultation; and he declared his opinion that there was another child in utero. Three weeks after her delivery she felt the movement of the fœtus; and on July 6, 1780 (five months and sixteen days after the first birth), she was again delivered of another living girl. The milk now appeared, and she was able to nurse the child. M. Cassan, in his thesis on "double uterus and superfœtation," adduces a case that occurred to Mad. Boivin. On the 15th of March, 1810, a woman, æt. 40, gave birth to a female infant, weighing about four pounds. As the abdomen still remained bulky, Mad. Boivin introduced her hand into the uterus; but found nothing within it. The examination, however, led her to suspect that there was another fœtus, either extra-uterine, or contained in a second cavity of the womb. On the 12th of May following she was delivered of a second girl, not weighing more than about three pounds, feeble, and scarcely able to support respiration. The mother assured Mad. Boivin that she had had no connexion with her husband, except on the 15th and 20th of July, 1809, and the 16th of the following September.*

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* Many instances are on record of a woman conceiving in utero, while she retained an *extra-uterine* fœtus in the abdomen; as I have noticed in my remarks on that extraordinary irregularity.

† Transact. Coll. Phys. Lond. vol. iv. p. 161. See Paris and Fonblanque's Medical Jurisprudence, vol. i. p. 264, for facts derived from Dr. Maton himself, refuting Dr. Granville's idea, that the first child was in this case prematurely expelled, and the other carried to full time.

‡ Foderé, vol. i. p. 484. See also Dévergie, tom. i. p. 471.

The only rational way of accounting for these cases is, on the supposition that each of these women possessed a double uterus, or one divided by a longitudinal septum; that one chamber became impregnated at first, and the other subsequently. And Professor Lobstein tells us, that he actually delivered a woman of two children, one a month after the other, and was able to convince himself that this was owing to her having *two uteri*, to each of which there was a distinct vagina.†

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* Churchill's Mid. p. 121. See also Velpeau, Ed. Brux. p. 193, for the same.

† Eclectic Repertory, vol. i. p. 370, Essay by Chapman. "There is, in the Pathological Collection at Vienna, a preparation of double uterus, each [chamber] of which bears evident marks of having been pregnant." Essay on the Viability of the Fœtus, by Alexander Campbell, Edinb. 1812. A case of double uterus, in which one chamber has been impregnated, is preserved in the London Hospital Museum. One somewhat similar, given by Dr. Lee, may be found in the Med. Chirurg. Trans. 1832, vol. 17, page 473; and another, where there existed two chambers, in the Med. Gazette, March 15th, 1831, p. 898. See Transactions of the Veterinary Medical Association, 1849, p. 299, for the notice of a case of superfœtation in a ewe. One lamb was born 12th of March, the other the 9th of April; both alive and well; and from the statement, we should be led to suppose both were of full size. She gave no milk until after the second was born. The probability is that this was a case of superfœtation; one of the cornua having been impregnated just four weeks before the other.

ON THE DISEASES

OF THE

PUERPERAL AND PREGNANT STATES.

and both were expelled simultaneously by uterine contraction. Mr. Eton, of Windsor, has reported one,* in which, after the body of one child had been turned, in consequence of a transverse presentation, the head of a second child came down into the pelvis, and prevented that of the first passing. As the child whose body was in the world was dead, Mr. Eton decapitated it, allowed the head to recede into the uterus, and delivered the other by the forceps; it also was born dead. The woman had an attack of pelvic inflammation, with inability to pass urine, for more than a month after delivery; but eventually recovered.

I was on one occasion sent for to the assistance of a midwife who had been pulling at two feet, which I found external to the vulva. Although they were a right and a left, I immediately detected, by the direction of the toes, that they belonged to different bodies; by gently pushing up one, and careful traction at the other leg, I extricated each breech from the brim of the pelvis, and both children were born living.

SECONDARY FŒTUS.—SUPERFŒTATION.

As connected with twin gestation, the expulsion of what is styled a *secondary fœtus* is worthy of observation. It sometimes happens that, after the birth of a living child at full time, a smaller ovum, or a dead embryo,† flattened, or otherwise disfigured, is thrown off, of an age evidently much less than the mature infant;‡ and this circumstance has led to the belief that *superfœtation* may occur in the human subject; or, in other words, that a second impregnation may take place, while the uterus already contains one ovum.§

I have already quoted some cases,‖ in which two connexions, following each other within a short time, were both prolific; and these may therefore be considered as true instances of superfœtation; but in such there is no doubt that the woman conceived of the second before the first ovum had entered the uterine cavity; before the formation of the deciduous membrane; and before the mouth and neck of the uterus were plugged by the tough gelatine, secreted by the *glandulæ Nabothi*. It is impossible to suppose that a subsequent impregnation can occur while one fœtus of four,

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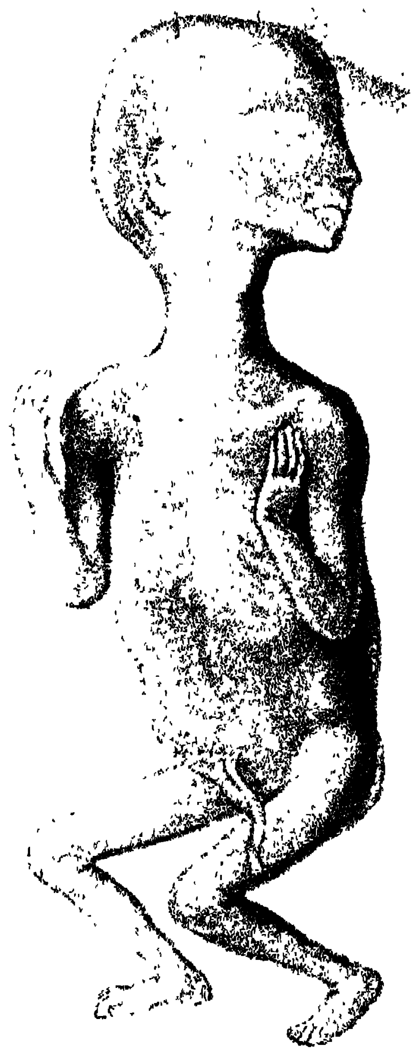
* Med. Gaz. July 24th, 1846, p. 152.

† Plate 85 represents "a secondary fœtus" of three months' age, flattened in the manner described in the text.

‡ Pliny (lib. vii. cap. xi.) has noticed this occurrence in the following passage:—"Et in aliâ [apparuit] *quæ unum* [fœtum] *justo partu, quinque mensium alterum edidit.*"

§ Haller's Outlines of Physiology, chap. xxxi. parag. 929. "Nos vidimus superfœtationem quandoque fuisse epidemicam affectionem." Musa Brassavolus, Comment. ad Aphorism. 38, lib. v. p. 817.

‖ Page 524.



ON THE DISEASES

OF THE

PUERPERAL AND PREGNANT STATES.

ON THE DISEASES OF THE PUERPERAL STATE.

THESE affections, various and peculiar, offer many points of interest to the physician, which the more ordinary complaints of females, perhaps, do not possess. The violence of their character, the rapidity of their progress, the fatality of some, and the acute symptoms attendant upon most, all combine to render their history highly worthy of attention, and to require for their subdual energetic and decisive measures.

It is certainly not too much to say, that in the treatment of diseases incidental to childbed, a somewhat modified plan must be pursued from that usually adopted in analogous affections unconnected with the processes of gestation and labour; and this principally depends on the high excitability of the nervous system then existing, and the speedy disorganisation of structure which takes place as a consequence of inflammatory action.

But, independently of the modified form that most affections assume after childbirth, every practical man agrees that this state is obnoxious to *peculiar* morbid actions of the most dangerous nature, unknown in any other condition of the body. For such reasons, then, puerperal diseases are most advantageously studied after we have become acquainted with the phenomena connected with those functions, on the completion of which they supervene, and from which they obtain their characteristic features.

As it would be difficult and useless to attempt any minute nosological arrangement of the diseases under consideration, I shall content myself with dividing them into the general and more

local; and first speak of those in which the local symptoms chiefly predominate.

SEPARATION OF THE RECTI MUSCLES OF THE ABDOMEN FROM EACH OTHER.

It will occasionally happen, especially in the case of women who have borne many children, and in those of a lax leucophlegmatic habit, that a few hours or days after delivery a division is observed to have taken place between the edges of the recti muscles, in some part of the *linea alba*, or a separation of some of the fibres in the belly of the muscle itself, or a similar solution of continuity in the track of the *linea semilunaris*.

This accident is dependent on mechanical distension of the abdominal parietes, which must have been weakened either by disease, or the strain to which they have been subjected. It is generally first noticed after an unusually severe or protracted labour; and it then most probably derives its immediate cause from the inordinate exertion which the abdominal muscles have been called upon to make. Even if the separation should occur during pregnancy it will very likely not be noticed until after labour; as a portion of the uterus will occupy the aperture, and fill it up, by its own solid body; but when that organ has expelled its contents, so that it takes up but a small space in the abdominal cavity, two or three folds of intestines will insinuate themselves through the opening, and occasion a hernial swelling of a greater or less size. This swelling will vary in form as in magnitude, according to the position of the patient's person, and the degree of quietude or of exertion to which she is at the moment exposed. Sometimes the degree of separation will not admit of the protrusion of a piece of gut larger than half a pullet's egg, or even less than that; while, on the other hand, I have known it extend throughout nearly the whole length of the *linea alba*, occasioning a longitudinal, soft, gurgling tumour, of three or four inches in depth, and the same in width at its base, reaching almost from the ensiform cartilage to the pubes. The process of separation appears to be slow, and not attended with pain.

When noticed after labour, it may be recognised by the peculiar feel of the tumour itself, — that belonging to protruded intestine; by the gurgling sensation communicated by the air within it, if it be large; by its being thrown prominently forward, when the muscles are placed in action, and retreating when they are flaccid; and by the margins of the aperture on each side being distinctly traceable whenever the muscles are contracted, as two firm ridges.

I have never known the edges unite again, so as to fill up the five, or six months' growth occupies the uterus. The gelatinous secretion which completely seals the mouth, as well as the decidua lining the cavity, would prevent the possibility of such a fresh conception taking place.

The phenomenon to which I allude is easily explained upon the supposition that the patient originally conceived of twins; that one lost its life early in gestation, either from some cause influencing the mother's system, or from some defect of structure or diseased action inherent in itself; and that the process of gestation was carried on for the benefit of the live fœtus, till they were both expelled together, or nearly at the same time, at the full period of pregnancy. The only difficulty attached to this solution is, that these secondary fœtuses, although invariably dead, are often perfectly fresh, bearing about them no marks of putrefaction. But this [illegible] be explained by their never-having been in contact with the external air; or perhaps it may be accounted for by the powerful vital principle, which is resident in the gravid uterus, and which is in fervid operation for the purpose of bringing to perfection the living being it contains, protecting the dead mass from the ordinary changes of decay; and acting as an antiseptic power.*

Generally the secondary fœtus is expelled from the uterus, either with the placenta of the living child, as in the case related in the note, or soon after; but occasionally some hours or even days have elapsed; and one instance came to my knowledge, in which the attendant was much blamed; it having been reported that the woman was left with a second child in the womb, while it was supposed that the labour was terminated. This "second child" was a blighted fœtus of about five months' age, and was expelled by uterine action, about thirty hours after the mature infant.

Thus such an occurrence may give rise to much undeserved opening; and when once a woman has become the subject of this unfortunate occurrence, she will probably not only have to bear the inconvenience to the end of her days, but every subsequent pregnancy will tend to aggravate the evil. Nevertheless, although a perfect cure is not to be expected in any case, much may be done to minister to her comfort and security, by means of a properly adapted bandage, with or without a pad, according as she finds most serviceable. Each case will of course require a different kind of support, as well in form as in degree; and the choice had better be left to the ingenuity and experience of one of the many females who devote themselves to the duty of contriving mechanical assistance, for patients labouring under these and analogous distresses.

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* A lady whom I had attended in labour three or four times, being caught in a smart summer shower, when about four months advanced in pregnancy, ran quickly home; she was soon seized with uterine hæmorrhage, followed by slight uterine contractions and some limpid discharge. I fully expected she would abort; but to my surprise the symptoms gradually gave way to rest, and other appropriate treatment; and she went on to her full period. She bore a living child, and at the same time with the placenta, there was expelled a dead, and somewhat flattened fœtus, of about four months' age, attached by the funis to an after-birth of appropriate size. There is no doubt that the exertion she made caused a partial separation of one of the placentæ, that the membranes of the same ovum were ruptured, probably by the contractions, and that the waters escaped. The death of that embryo necessarily took place; but the principle of vitality was so strong within the uterus, that gestation was continued for the sake of the living fœtus that it contained; and the mature child and dead embryo were expelled nearly together. The pressure they must be subjected to, between the growing ovum and the walls of the uterus, if the waters surrounding them are discharged, will account for the flattened state in which these secondary fœtuses are generally seen.

PROLAPSUS UTERI,

Or falling down of the womb, is by no means an uncommon occurrence after the birth of a child. When it is immediately connected with labour, it mostly happens a few days subsequently, on the patient's first rising from her bed, either to sit or stand; and is the consequence of the vagina and uterine ligaments being, in their relaxed condition, unable to sustain the increased weight they are then compelled to bear. It varies in degree from the slightest subsidence to the appearance of the whole organ externally, covered by the inverted vagina; and whenever any portion protrudes without the labia, the complaint is called *procidentia uteri*. The same accident, however, may be produced by a violent fit of vomiting, coughing, or sneezing, while the patient is in the recumbent posture, or it may supervene on immoderate action of the bowels; in such case, it will most probably manifest itself within a few hours after the process is completed. Women of relaxed fibre, those who have borne many children, who have suffered a lingering or instrumental labour, or in whom a laceration of the back part of the vagina and perineum has occurred, are most liable to this affection. It is characterised by a sense of weight and pressure downwards, principally referred to the fore part of the pelvis, much aggravated on assuming the upright posture, together with a dragging pain in the loins, and sometimes an aching pain in the iliac regions; and it is accompanied generally by an increased flow of the lochial discharge. There is frequently a difficulty in passing urine, and sometimes tenesmus, or inability to void the rectum without straining.

Treatment.—In this early period after delivery, no means can be taken except the most simple, for removing this troublesome affection. Perfect quietude, in the horizontal posture, either in bed or on a sofa, must be preserved for many days, whenever censure; and the medical attendant should be prepared to afford a direct explanation of the circumstance, whether the blighted fœtus passes immediately on the birth of its twin brother, or at some considerable interval after. A body of this kind occupies so small a space, that its presence in utero could scarcely be detected by the hand externally applied. The uterus may, indeed, feel larger than it should do, and hard; but the same sensation would be communicated by a coagulum detained within its cavity; and until it escapes, I know of no means to distinguish the one mass from the other.

I have just said that it would appear impossible for a woman to conceive of a second ovum, while the uterus already contains one.* But some cases are reported, which, on a superficial view, would lead to the belief that such an occurrence might happen. Thus Maton has put on record,† that a lady was delivered on Nov. 12, 1807, of a boy, which was strong and hearty, and on the 2nd of February, 1808 (not quite *three calendar months* from the preceding date), of another boy, also at full time. And Desgranges‡ has reported another of a very extraordinary kind. A woman brought forth a living child at seven months, on January 20, 1780; but no milk was secreted, no lochia flowed, and the size of the abdomen was scarcely at all diminished. Dr. Desgranges was called, in consultation; and he declared his opinion that there was another child in utero. Three weeks after her delivery she felt the movement of the fœtus; and on July 6, 1780 (five months and sixteen days after the first birth), she was again delivered of another living girl. The milk now appeared, and she was able to nurse the child. M. Cassan, in his thesis on "double uterus and superfœtation," adduces a case that occurred to Mad. Boivin. On the 15th of March, 1810, a woman, æt. 40, gave birth to a female infant, weighing about four pounds. As the abdomen still remained bulky, Mad. Boivin introduced her hand into the uterus; but found nothing within it. The examination, however, led her to suspect that there was another fœtus, either extra-uterine, or contained in a second cavity of the womb. On the 12th of May following she was delivered of a second girl, not weighing more than about three pounds, feeble, and scarcely able to support respiration. The mother assured Mad. Boivin that she had had no connexion with her husband, except on tendency towards prolapsus shows itself; and in this, together with the due regulation of the bowels, and the exhibition of tonic medicines, if thought necessary, consists the principal part of our practice; for it would be injudicious to use any local means internally, either for the purpose of supporting the womb or strengthening the tone of the parts while the lochia are flowing. Pessaries are out of the question; and the injection of astringents into the vagina would be likely to occasion inflammation, both by suppressing the discharge, and by the irritation they must produce on the lining membrane of the womb itself. Cold, indeed, might be applied externally with advantage, and a napkin, worn so tightly as to produce some pressure, might be serviceable. The origin of *chronic* prolapsus uteri, which is often so distressing throughout life, and produces so many functional derangements, or even lays the foundation for such serious organic disease, is frequently, if not generally, to be traced to some mismanagement after labour, or inattention to the preservation of the recumbent posture sufficiently long after an abortion. There is no affection of the uterus more common, especially among the poorer class, than this; and no means should be neglected which can prevent so serious a calamity. The consideration of this complaint, however, in its chronic state, would be out of place here.

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* Many instances are on record of a woman conceiving in utero, while she retained an *extra-uterine* fœtus in the abdomen; as I have noticed in my remarks on that extraordinary irregularity.

† Transact. Coll. Phys. Lond. vol. iv. p. 161. See Paris and Fonblanque's Medical Jurisprudence, vol. i. p. 264, for facts derived from Dr. Maton himself, refuting Dr. Granville's idea, that the first child was in this case prematurely expelled, and the other carried to full time.

‡ Foderé, vol. i. p. 484. See also Dévergie, tom. i. p. 471.

PROFUSE FLOW OF THE LOCHIA.

I have already* characterised the lochial discharge as an exudation of blood from the patulous orifices of the uterine vessels, and have described, that as the uterine fibres continue their due contractions after labour, and the organ gradually assumes its small unimpregnated size, these apertures become slowly diminished in capacity, and are eventually entirely closed. As this process is going forward, the discharge is altered in character and appearance; at first the whole constituents of the blood escape; after a time, however, the firmer parts are retained, and the serum only exudes, which is tinged for a few days with the red particles, but ultimately becomes almost colourless. It would be erroneous, then, to class the lochial discharge among the secretions of the body; and if we form a proper idea of its character, we shall be most likely to treat effectually its irregularities.

One of the most frequent deviations from its healthy condition consists in the evacuation being more profuse, and its continuance longer than nature intended. It is evident that under such a state the system must be depressed in proportion as the discharge is the 15th and 20th of July, 1809, and the 16th of the following September.*

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* Page 149.

The only rational way of accounting for these cases is, on the supposition that each of these women possessed a double uterus, or one divided by a longitudinal septum; that one chamber became impregnated at first, and the other subsequently. And Professor Lobstein tells us, that he actually delivered a woman of two children, one a month after the other, and was able to convince himself that this was owing to her having *two uteri*, to each of which there was a distinct vagina.†

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* Churchill's Mid. p. 121. See also Velpeau, Ed. Brux. p. 193, for the same.

† Eclectic Repertory, vol. i. p. 370, Essay by Chapman. "There is, in the Pathological Collection at Vienna, a preparation of double uterus, each [chamber] of which bears evident marks of having been pregnant." Essay on the Viability of the Fœtus, by Alexander Campbell, Edinb. 1812. A case of double uterus, in which one chamber has been impregnated, is preserved in the London Hospital Museum. One somewhat similar, given by Dr. Lee, may be found in the Med. Chirurg. Trans. 1832, vol. 17, page 473; and another, where there existed two chambers, in the Med. Gazette, March 15th, 1831, p. 898. See Transactions of the Veterinary Medical Association, 1849, p. 299, for the notice of a case of superfœtation in a ewe. One lamb was born 12th of March, the other the 9th of April; both alive and well; and from the statement, we should be led to suppose both were of full size. She gave no milk until after the second was born. The probability is that this was a case of superfœtation; one of the cornua having been impregnated just four weeks before the other.

copious, and its flow protracted; and sometimes it produces all the effects of chronic hæmorrhage. Women of debilitated habit and relaxed fibre, and those who have borne many children, are most subject to this irregularity.

Treatment.—Regarding it as blood, oozing from the apertures of vessels, which have not as yet acquired their proper contracted state, our indications would be to treat it as a sparing hæmorrhage, and to endeavour to excite such a degree of action in the uterus as will render these orifices gradually impervious. The discharge may be restrained by rest, the recumbent posture, the local application of cold, the admission of cool air frequently into the apartment, abstinence from all stimuli and hot fluids, the regulation of the bowels, and the judicious use of the mineral acids; and the uterus may probably be stimulated to more perfect contraction by moderate pressure, and the exhibition of the ergot of rye. This, then, will constitute the chief of our treatment.

SUPPRESSION OF THE LOCHIA

Is seldom or never to be considered as an idiopathic affection; it is generally dependent on some derangement of the system,—either fever or inflammation,—or some unhealthy state of the uterus itself; so that, with a view to its restoration, the cause of the suppression must be sought out, and the morbid condition, whatever that may be, must be removed. The *sudden* disappearance of this natural evacuation two or three days after labour, must always be looked upon with some anxiety; for it will frequently be found accompanied or quickly followed by a train of alarming symptoms.* The prejudice among women, indeed, is so great respecting the necessity of this flow being duly kept up, that they often attribute any inconvenience, pain, or disease they may be suffering, to its cessation as a cause, when indeed, such symptom ought properly to be regarded merely as an effect.

HÆMORRHOIDS OR PILES,

Dependent on a varicose condition of the hæmorrhoidal veins, are often very troublesome under the puerperal state; and some women are subject to them after labour, who experienced no inconvenience at any other time. When they appear a day or two subsequent to the birth of a child, they are for the most part highly irritable and painful, often acquiring the size of a large grape; occasionally only one protrudes beyond the sphincter; more frequently three or four are external. In some instances, after remaining some time outward, they gradually decrease in size, retreat again within the bowel, and do not protrude any more until the next pregnancy, or after the next labour; at others, although they pass up for a time, they appear again with each evacuation of the intestine, and continue to trouble the patient much, bleeding, perhaps, at intervals; while in other cases, again, they remain constantly without the sphincter, and changes take place in them, by which they are converted into solid tumours. They often become strangulated and inflame, and have been known to slough.

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* "On our revisiting the patient, we sometimes learn that this discharge is suppressed altogether; an accident which ought always to attract your attention."—(Blundell's Obstetricy, by Castle, p. 797.)

Symptoms.—These swellings are attended with a dull, heavy, and sometimes violently acute pain in the region of the anus, tenesmus, and a feeling, after the bowel has been entirely emptied, as if there were still something to come away; blood also often passes with the fæces. On an ocular examination being instituted, if they are external, one or more shining, florid, or rather bluish livid tumours, will be observed at the verge of the anus, varying in size from that of a small currant to a grape, sensible to the touch, and perhaps acutely painful.

Treatment.—In the recent irritable state that I am now supposing, in which we mostly see them after labour, the best means of relief is to return them within the intestine as soon as they are protruded, — provided that can be accomplished without much exertion or producing great pain. Should this not be practicable, however,—and I think it can seldom be effected,—two or three leeches to the piles themselves, poultices, anodyne fomentations and injections, and opium, mixed with hog's-lard, applied as an ointment, or introduced as a suppository, (preserving at the same time a loose state of bowels,) will be most likely to lessen their size and irritability, and to procure for the patient a diminution of suffering.

VIOLENT AFTER-PAINS.

A very common cause of annoyance after delivery, is the continuance of those painful uterine contractions, which constitute the throes of parturition, and by which the volume of the womb becomes further diminished in capacity. The proper duration of this action, indeed, is not only salutary, but necessary to the patient's well-being, and, as a general principle, must not be interfered with;* but when the pains return more frequently than usual, or when by their violence they prevent sleep, induce irritability, or occasion feverish feelings, it is right that they should be mitigated or removed. They appear soon after the expulsion of the placenta, and last two or three days, gradually subsiding as the period of labour becomes more distant. They are seldom severe after the birth of the first child, and are more distressing when the patient has borne a large family. They are often attended with the expulsion of coagula, and usually return, or are increased in severity, on the application of the infant to the breast.

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* "The sufferings of women from these pains are sometimes very great, though they prove eventually salutary; and, if we had it in our power, should not be suppressed, till the end for which they are excited is answered."—Denman, chap. xix. sect. 1.

Causes.—The *immediate* cause of the pain is the contraction of the uterine fibres, perhaps attended by some peculiar excitability or sensitiveness of the organ itself, or irritability of its nerves. The *exciting* cause is in many instances to be traced to a loaded state of bowels, but it is also not unfrequently found to be a coagulum, or a small piece of membrane, left in the uterus after the delivery of the placenta; and it is partly in order to prevent the accession of violent after-pains, that I have recommended the young practitioner to be particular in removing, if possible, the whole of the membranes from the uterus on the withdrawal of the placenta. Should the slightest portion be left, it acts as a foreign body, irritates the womb, and excites in the organ painful contractions for the purpose of getting rid of it; but however severe the suffering may be, if there be no inflammation or congestion present, we may with truth affirm that the case is not attended with danger, and we may comfort our patient by the assurance that they will speedily disappear.

Diagnosis.—After-pains are distinguished from any pain dependent on a more dangerous cause, by their situation, by their commencing in the uterine region, and extending round the loins and down the inside of the thighs, by their intermitting character, and the perfect freedom from uneasy sensation in the interval of their recurrence. We may be certain that these pains do not depend on inflammatory action, because pressure does not produce increased distress—unless, indeed, it be so great as to cause a fresh contraction; this state is very different from inflammation of the uterus, for then the slightest steady pressure occasions acute suffering. They may likewise be known from hysteritis by their being accompanied with little or no fever, by neither the lochia nor milk being suppressed or diminished, as is usual in inflammation of the womb, as well as most febrile diseases after delivery, —by the patient, indeed, being altogether in a comfortable state, except when the painful contractions recur. Another indication will often be the impatience which she manifests under these teasing and tormenting paroxysms; for I have usually remarked that women bear them with less fortitude than they evince when their suffering arises from a more serious cause. But the best diagnostic mark of all, perhaps, is the state of the pulse ; in simple after-pain, however severe the paroxysm, the pulse is not at all or but slightly affected; it preserves its average frequency. On the contrary, when the pain arises from inflammation, it is always quickened, rising to 120 or 130 beats in the minute. It may indeed be laid down as an axiom, that when the pulse is much accelerated for the first two or three days after labour, there is either fever or inflammation present, or some danger threatened.

Treatment. — Since after-pains, if unconnected with inflammation, are not attended with danger—since in a moderate degree they are salutary and useful—we might be inclined not to interfere with them in any case, waiting patiently for their spontaneous cessation. But, on the other hand, since pain is so great an evil ; since it is evidently as much the duty of the physician to relieve suffering — provided that can be done without compromising the welfare of his patient—as it is to subdue disease ; and especially since, by their continuance, they may induce irritability, wakefulness, and excitement, with a host of morbid actions which may ultimately terminate in perilous derangements, we should not be acting wisely if we allowed them to proceed unchecked. Every one knows in his own person how irritable pain in any part of the body makes him, though it may not be produced by a dangerous cause; how feverish he becomes ; how many of the functions are interfered with ; and how soon he slides from a state of health into one of disease. So it is with respect to after-pains; and such a probability should be always present to our minds. Relief may generally be readily afforded. As a loaded state of the lower intestines often gives rise to them, they will probably yield to free purging. A dose or two of jalap, and infusion of senna, will frequently place the patient in comparative ease; but if they continue after the bowels have been freely acted on, recourse may be had to opium in any of the forms which can best be borne. Purging and opium are the means on which we principally rely, combined with moderately spare diet, perfect rest, injections into the rectum, either simple or anodyne, and fomentations, or anodyne embrocations, if thought advisable.

VASCULAR CONGESTION OF THE UTERUS

Will naturally force itself on our attention after the subject last discussed, because of the similarity of many of the symptoms and the identity of the organ affected.

Although a congested state of the uterine veins is not generally spoken of by authors, I am fully persuaded that it not unfrequently occurs, unattended at the onset with arterial excitement; and I have arrived at this conclusion because the disease is not accompanied by the same degree of febrile action which we remark in hysteritis, and because it may be removed by milder measures. If, however, it be allowed to proceed unchecked, active inflammation both of the uterus and peritoneum may supervene. This complaint is usually observed on the second or third day subsequent to delivery; sometimes, however, it occurs almost immediately after. It mostly follows a lingering or instrumental labour, one in which the hand has been introduced into the uterine cavity for the purpose of turning the child, or removing the placenta, or where the infant has lain dead *in utero* until putrefaction has taken place; but sometimes it appears after the most natural and easy birth.

Causes.—The immediate cause seems to me to consist in the apertures of the uterine veins being rendered for a time impervious, and the consequent *engorgement* of those vessels by the retention of the blood which ought to escape; for I have invariably remarked that, under this affection, the lochia are either entirely suppressed, or flow most sparingly.

Symptoms.—Pain, together with an enlarged and hard state of the uterus, and suppression of the lochial discharge, are the most prominent of the symptoms present. The pain is situated in the uterine region, affecting the loins and thighs: it is constant and uninterrupted, but exacerbations of suffering to a violent degree occur periodically, occasioned by the contractions of the uterus. It is seldom ushered in by rigors, although if the disease be not arrested, shiverings will most probably take place as soon as inflammatory action is set up. Pressure on the uterus produces an aggravation of the pain, as well in consequence of the increased sensibility of the organ itself, as from the stimulus occasioning a contractile action in the uterine fibres. Under the hand the uterus feels much larger than natural, the principal part being detected above the pubes; and it is exceedingly hard, the tenderness being confined to the organ itself. The lochia, as just mentioned, are invariably either entirely suppressed, or exceedingly scanty, and serous. The supply of milk is seldom diminished; the pulse is not much accelerated, but usually somewhat hard; there is generally moisture on the skin; the bowels are easily acted on, and the urine is natural. Sometimes headache attends, but not frequently, occasionally nausea and a sense of sinking, especially on an accession of uterine contraction. The patient could sleep well, if she were not harassed with the distressing pain.

Treatment.—I have just remarked that the same energetic means are not required for the subdual of congested uterus as we find necessary in inflammatory disease. I have not often, indeed, been obliged to bleed largely, and have mostly found the affection subside on the application of twelve or eighteen leeches to the hypogastric region, aided by a brisk purgative of calomel and other cathartics, and emollient injections into the bowels. Should, however, the symptoms not give way in a few hours, venesection will be indicated; and this especially if the disease be running on into the inflammatory state. The patient will, therefore, require close watching; and one of the most favourable symptoms we can observe is a free return of the lochial discharge. The uterus, indeed seems more relieved by the loss of a few drachms of blood from its own vessels, than a much larger quantity from any other part. Fomentations, saline medicines, and a rigidly abstemious diet, are called for in most cases. The affection is not of long duration; for it will either soon give way, or inflammatory action will be established. Dr. Robert Lee, in his Essay on Puerperal Fever, published in the Cyclopædia of Practical Medicine, says, "Like inflammation of other organs of the body, that of the uterus varies greatly in severity in different cases. At some particular periods we have remarked the existence of a disposition to the disease, in certain puerperal women, evinced by tenderness of the uterus on pressure, and by acceleration of the pulse, when inflammation has not been actually developed, or when it has taken place in so slight a degree as to yield readily to the exhibition of opiates, and the application of cataplasms and hot fomentations to the hypogastrium." This is the state which I have endeavoured to describe, and which I would rather designate congestive than inflammatory.

Burns,* again, appears to me to treat of this disease under the name "Hysteralgia," and says it often excites inflammation. The affection which I mean does not differ in the least from a congested state of other viscera; which we know exists without actual inflammation; but which, if not removed, often results in inflammatory action.

HYSTERITIS

Sometimes arises as a sequela to the affection last described, and at others originates independently of previous congestion. It also usually follows a lingering or artificial labour, or one in which the placenta has been removed by the introduction of the hand; and commences within a day or two after delivery. It is ushered in by one or more rigors, varying in intensity, which are speedily succeeded by increased heat of skin, accelerated and hard pulse, dryness of the mouth, furred tongue, and other symptoms of inflammatory fever. If no remedial means are applied, the disease may spread to the peritoneum, involving that membrane in a most dangerous degree of vascular excitement, though this is certainly rare; or the inflammation may subside by resolution: or gangrene of the organ may occur; or pus may be formed, either in the structure of the uterus itself or in the cavities of the large venous reservoirs, denominated *sinuses*. When these latter appearances have been discovered after death, the peritoneum is usually involved in the disease; and the case during life has assumed the worst features of "puerperal fever."

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* Principles of Mid. 5th edit. p. 506.

It is seldom that gangrene of the uterus occurs; more frequently, if the disease destroy, the fatal result is owing either to the peritoneum having become affected, to the secretion of pus in the cavities of the veins, or to the formation of abscess in the substance of the organ itself. If pus be secreted, it may evacuate itself externally; it may burst into the uterine cavity, and flow through the vagina; it will occasionally insinuate itself between the layers of one of the broad ligaments, and, following the course of the round ligament, make its way outwardly at the groin; and it has been also supposed, that the uterus sometimes becomes adherent to the abdominal muscles, and that the matter has escaped by ulceration through the abdominal parietes. I have myself great doubt whether the last-mentioned process ever takes place. I have certainly seen an abscess in these muscles frequently follow acute hysteritis, and a mitigation of the local symptoms attend the formation of the matter; but I have been quite sure in most of these cases, and have had good reason to believe in the others, that the abscess has originated in the fleshy substance of the muscle itself, and I consider that it may be looked upon as of a *critical* nature. It is, indeed, very possible that the same kind of critical suppuration may appear in the fleshy fibres of other muscles of the body; and pus has often been observed deposited within the larger joints.

The causes of inflammation of the uterus are not always very evident, but sometimes they may be easily recognised; we may occasionally trace the disease to injury sustained during labour; either from long-continued action, or from the hand having been introduced for the purpose of turning the child, or removing an adherent placenta; to the patient's being carelessly attended, or being exposed, after delivery, to cold, or to various excitements. Among the poor in this town, one of the most frequent sources consists in indulgence in improper and stimulating diet, too early after the child's birth.

Symptoms.—Independently of shivering and other general symptoms of inflammatory fever, such as furred tongue, accelerated pulse, and dryness and heat of the surface, there is local pain in the hypogastric region, referred round to the loins and along the inner part of the thighs, much increased on the pressure of the hand, as well as on each return of the after-pains. The uterus is felt larger and harder than natural, as in more simple congestion; the lochial discharge is suppressed, or flows sparingly—is of a dark, dirty colour, and possesses a fœtid odour; the milk is diminished in quantity; the urine and most other secretions are also defective. There is generally a frequent desire to evacuate the bladder, and its contents are voided with much pain; and if an examination be made by the vagina, the os uteri will be found hot and exquisitely tender. Should the disease spread to the peritoneum, the pain will become more diffused, accompanied by the other signs of inflammation of that membrane, hereafter to be enumerated; and should an abscess form in the uterine structure, or gangrene occur, excessive prostration of strength will be observed; the countenance will become rapidly pale, and expressive of great anxiety; the pulse will lose its firmness and become so quick as to be counted with difficulty; the respiration will be hurried, laboured, and distressing; coldness of the extremities, with clammy perspiration, will succeed to the previous heat and dryness; the tongue will become foul; the teeth and lips coated with dark sordes; vomiting and uncontrollable diarrhœa will for the most part make their appearance; while incoherence, coma, or muttering delirium, with subsultus tendinum, will be the harbingers of death.

Treatment.—When active inflammation has commenced, the treatment must be much more vigorous than that recommended in the congestive state of the veins. The affection is of a most dangerous character, and runs on quickly to its termination: no doubt resolution would occasionally happen, even were no remedial means applied; but more frequently. I fear, the natural result would not be so fortunate. It behoves us, then, to attack the disease by energetic measures; and in most cases, at the commencement, blood may be taken liberally from the arm. If the patient be of a strong constitution, or plethoric temperament, a more moderate bleeding may be resorted to, a second or even a third time, provided the symptoms are not mitigated after the abstraction of the first quantity; or if, having for a period subsided, they return with violence. Leeches will be found highly useful, applied either upon the hypogastrium, or just within the vulva; cupping on the sacrum, or loins, might be advantageous, but such a method of relieving the inflamed vessels is inconvenient, and cannot well be practised. Blisters and other irritants to the hypogastric region, I have not generally found answer my expectations: much comfort and advantage, however, may be derived from fomentations; and the external application of flannels, steeped in warm oil of turpentine, has been highly extolled, and promises some benefit. However much the head may be affected with pain or confusion, if the disease be seated in the uterus, more advantage will be gained by the application of leeches, or other topical remedies, to the neighbourhood of that viscus, than either to the forehead or nucha. At the same time it is desirable, should there be much disturbance of the sensorium, with preternatural heat of surface, to shave the scalp, or cut the hair close, and apply an evaporating lotion. In many instances I have experienced the good effects of one or two pints of warm water, thrown at intervals of four or six hours, by means of a patent enema syringe, into the uterus itself: a mitigation of suffering has generally followed the injection; and advantage seems to have resulted, from that organ and the vagina having been cleansed of the unhealthy and fœtid discharges which have accumulated within their cavities. It is better that this operation should not be trusted to a nurse, but undertaken by the medical attendant himself; for it is always more efficacious when the water is thrown into the cavity of the uterus than when it is merely injected into the vagina. This will require that the extremity of the pipe should be insinuated within the uterine orifice; and in an inflamed state of the viscus it is not safe that any other than a medical practitioner should perform a duty of this kind. A tepid enema also acting as an internal fomentation, may sometimes prove of essential service. Free purging is absolutely requisite; and repeated doses of calomel, if it can be borne, or some milder preparation of mercury, will much assist our other curative measures.

It must be evident that the treatment just advised is only applicable to the inflammatory stage. When the symptoms of depression have supervened, the continuance of the depleting practice would add to the danger, and hasten on the fatal termination. Even although the state of the patient may appear hopeless, it is yet not right that we should abandon her to her fate; for the resources of Nature are so abundant, and her powers so wonderfully great, that an effort at restoration may be made at a moment most unexpected; it now becomes our duty no longer to check her actions, or to resist her endeavours, but to co-operate with her in obviating the sad consequences of her own irregularities. This we can best do by stimulating the nervous system, so as to rouse the flagging action of the heart, and by sustaining the drooping strength.

The former of these objects may, perhaps, be effected by spirits, wine, ether, ammonia, camphor, or opium, conjoined with aromatic medicines; and the latter, by as liberal a supply of easily digestible nourishment as the stomach will bear without distress.

INFLAMMATION OF THE MAMMA.

We cannot wonder that inflammation of the breast is of frequent occurrence after delivery, in consequence of the sudden and copious determination of blood to the organ for the formation of milk. This disease may, indeed, first appear towards the close of pregnancy, though this is very rare,* or at any period during lactation; most commonly, however, it shows itself within the puerperal month. The inflammatory disposition may be confined, at its commencement, to one spot, or it may attack a considerable portion of the substance at the same time; both breasts may even become diseased simultaneously; but, however circumscribed the affection may be at the onset, it generally spreads rapidly, and involves a great part of the organ in its consequences. It is very possible that the increased action may originate in the cellular tissue, but most commonly it first attacks the glandular or tubular structure itself. There is a great tendency towards the formation of pus, which, even under the best care and most skilful management, can often not be avoided. The process of suppuration goes forward with very varying rapidity, and when the abscess bursts, small sloughs are generally evacuated with the matter.† I have known pus quickly produced in the substance of each mamma at the same time, and, burrowing underneath the skin and above the sternal bones, form a connexion between the two breasts, so that both the organs communicated by means of one cyst.‡

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* I have only personally known three instances of suppurating mamma during gestation.

† Some cases of mammary abscess are attended with great agony, while in others there is comparatively but little pain. The difference appears to me to depend on the original situation of the inflammatory action. If one or more of the mammary glands be the seat of the disease, the pain is acute; if, on the contrary, the inflammation be confined to the cellular structure, as is sometimes the case, the suffering is much less severe. Dewees, also (Diseases of Females, Philadelphia, 1833, p. 501) says, when the cellular structure is the original seat of the inflammation, the pain is much less, and suppuration more rapid, than when the disease first attacks a gland. The external inflammation is also much less, and it is rarely attended with œdema. He thinks too, it is more difficult to check the suppurative action, commencing in the cellular web, than in the glandular substance.

‡ I was once sent for to see a woman, on the third or fourth day after delivery, in a state of the most furious delirium that can be conceived, which had come on rather suddenly. She appeared labouring under acute phrenitis, and in the most urgent danger. A copious bleeding seemed absolutely indicated; but on examining the breasts, (as should be done in all puerperal diseases,) I found them both very large and tense, and the surface red; fluctuation was distinguishable in each; it was evident that they had both suppurated, and probable that the violent symptoms depended on their condition. They were freely opened, and in less than an hour the patient had recovered her reason. This instance would teach us, however clear the case may appear at first sight, on all occasions to examine into the state of every organ which can throw any light on the symptoms present, before very active treatment is adopted.

Symptoms.—All women are liable to this affection, but those of a weakly, delicate, and particularly a strumous constitution, seem most obnoxious to it. It is usually ushered in by rigors, and attended with considerable fever; pain, of a shooting kind, is experienced in the mamma, much increased on pressure. On examination, a circumscribed, hard, and painful tumour may be distinctly felt, even before any redness appears on the surface: after a time, the swelling is more diffused, the skin covering it assumes a dusky-red colour, and becomes hot and shining, slight œdema takes place, which is a sure sign of the presence of deep-seated matter, and a subdued sense of fluctuation soon shows itself. The formation of matter is attended by an exacerbation of the symptoms: the local tenderness and throbbings are increased, the volume of the diseased breast enlarged, and the accompanying fever heightened. If the drain continue for any length of time after the evacuation of the pus, a gradual loss of strength, appetite, and flesh, is observable; distressing rigors occur daily; the patient obtains but little refreshing sleep, and is annoyed by profuse nocturnal perspirations: sometimes she is harassed with sickness; more frequently with obstinate diarrhœa.

It is seldom that a woman who declines nursing altogether becomes the subject of suppurating mamma. I cannot call to mind, indeed, a single instance of this occurrence in my practice. This is exactly contrary to what might have been expected. We should have supposed that the milk, having been secreted, and stagnating in the ducts until it was removed by absorption, would have caused so much irritation as to excite inflammation, and suppuration in almost all cases; and we should have looked for this complaint particularly in those cases where the child was still-born, or had died soon after labour; or where, for convenience sake, an attempt was made to suppress the secretion. It is the patient who suckles her child in an unsatisfactory manner, and who never allows the breast to be well emptied, that is most liable to this troublesome disease.

Although very rarely fatal, inflammation of the mamma is by no means to be lightly regarded. It is tedious, difficult to cure, and in most instances attended with much suffering. Under the suppurative action, especially when successive abscesses have formed one after another, the body has been known to dwindle almost to a shadow. In some instances, the patient has sunk under the debility induced; and in many others, the same cause has called forth into life and activity the lurking seeds of organic disease, which, until that period, had lain within the system dormant and inert. This remark is particularly applicable to phthisis pulmonalis.

Causes.—Inflammation of the mamma may be excited by a blow, the application of cold, perhaps by irregularities in diet, and mental emotion: but it most frequently originates from undue accumulation of the secretion within the lactiferous ducts themselves. Most of these causes, then—especially the latter—are particularly likely to operate in the persons of women who devote themselves more to society than their domestic duties, and who are frequent visitors at the theatre; for, under such circumstances, the relief which the breast requires for its preservation in a healthy condition, cannot be readily obtained. But I think the most usual cause of such accumulation may be referred to a disinclination on the mother's part to allow her infant to suck, in consequence of the nipples being tender, chapped, or ulcerated. The suffering, attendant on the friction of the tongue and lips, induces her to avoid putting the child to the breast, except for the purpose of relieving her from the immediate distress occasioned by tension. I need scarcely remark that this partial evacuation is not enough to avert the risk of inflammatory action; and it should be the part of the medical adviser honestly to depict the danger likely to result, and strongly to urge the necessity of the bosom being more perfectly emptied.

Treatment. — The treatment of inflamed breasts differs in no respect from what is required in the inflammatory condition of other glands. Leeches must be had recourse to, as soon as the affection is discovered to exist; * and repeated as occasion may require; brisk purgatives must be exhibited; an unstimulating, though not abstemious diet recommended; and poultices and warm fomentations will generally be found to answer better, both in mitigating the pain and subduing the inflammatory disposition, than any cold or evaporating lotion.

As soon as the abscess points to any particular part of the surface (although it be not yet near bursting spontaneously) the lancet should be had recourse to. There is a great prejudice existing among women, against the matter being let out artificially, and it is probably founded upon the idea—to a certain extent, indeed, true—that if the operation be performed prematurely, there is considerable risk of other glands in the mamma becoming affected, and of the disease attacking many of them in succession. In my own opinion, there is much greater danger in allowing the abscess to burst spontaneously—especially if it be originally deep—because the loose structure of the organ favours the *burrowing* of the matter; a large portion of the breast may therefore be destroyed, an extensive sinus is formed, and more formidable difficulties will oppose the cure. During the whole progress of the disease the mamma should be supported; and after it is opened this is best done by long strips of mild adhesive plaster carried below and around it; which will require to be changed twice daily. By this means a gentle pressure is kept up, the fluid is more perfectly evacuated as it is formed, and there is a better chance afforded that the cavity will fill up from the bottom by the union of its sides. Pieces of lint, too, dipped in warm water, and applied smoothly over the breast, covered by a fold of oiled silk, will be found a more convenient and grateful application than a poultice. This kind of dressing answers all the purposes of a poultice, without being so cumbersome, and without fretting the skin, as poultices often do, when applied for any length of time continuously.

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* Dewees (Op. cit. p. 503) says he has never found any local application so beneficial, in the early stage of this disease, as warm vinegar. He considers it the most certain as well as most comforting means that can be used. He recommends it to be persevered with for twenty-four hours; and if, after that time, the pain or intumescence be not abated, that leeches should be applied. Experience, however, has convinced him that "leeching is much more successful, *when performed below the breast*, instead of on the tumid portion of it." The leeches should therefore be applied "an inch below the circular margin of the mamma." I am myself persuaded that, if leeches are used, it is better for them to be applied *around* the indurated nodule, rather than *directly over* it; and that whenever there appears the least blush of redness on the surface, leeching the part itself is likely to do much harm.

Should the internal ulcer show little disposition to heal, and a troublesome sinus remain, astringent injections, particularly a weak solution of nitrate of silver, may be used; and we are recommended by Burns,* as well as other surgeons, to lay it freely open upon common principles. No doubt, by such a proceeding, a more speedy cure might be effected; but the operation is painful, and not without its dangers; and few women could, I think, be persuaded to submit to it, unless their life were in some hazard; in my own practice, indeed, I have never found it necessary, and have consequently never resorted to it. Dr. Physic † has succeeded in perfecting a cure by an operation less formidable than that suggested by Hey, and recommended by Burns,—the employment of a seton. An armed probe is to be passed to the extremity of the sinus, and cut down upon from without; the silk is then to be drawn into it, and allowed to remain three or four weeks undisturbed. The indication for its withdrawal being a diminution in the quantity, and an amelioration in the character of the pus.

After the evacuation of the pus, we shall require to sustain the system by nourishing diet, and wine, or good malt liquor. Change of air is desirable, or a daily ride, if the patient can bear it and the weather will permit. Tonic remedies are also of great service; of which, quinine or some other preparation of bark, will be found the most beneficial. I need scarcely remark on the necessity of procuring regular and satisfactory evacuations from the bowels.

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* 5th Edit. book iii. chap. 22.

† Dewees, Op. cit. p. 506.

In the treatment of an inflamed mamma, it is of much consequence to determine whether the infant shall be kept to the diseased breast, whether it shall only be allowed to take the sound one, or whether it shall be separated from its mother altogether; and the answer to each of these questions will depend entirely on the circumstances of the case. In the first stage of the complaint, before suppuration has commenced, I think it a matter of great importance to keep the breast in as empty a state as possible; because, by so doing, we shall take the best means of preventing the formation of matter, and the consequent disorganisation of structure. With this object the child should be applied to the affected side with even more assiduity than the other. We shall perhaps meet with some difficulty in enforcing this request, because of the pain suffered whenever suckling is attempted. If the patient's infant be very young and awkward, it is better to obtain an older child, for the purpose of keeping the milk under; here, however, another difficulty meets us, for there are but few women who will allow their child to take the breast of a stranger in ill-health, especially when a probability exists of the formation of mammary abscess; nor, indeed, can we condemn the feeling. Under such circumstances the exhausting pump, or breast-pipe, must be had recourse to: or, what is infinitely better, a strong and healthy puppy may be applied as occasion requires.* If, notwithstanding our best care, the progress of the disease cannot be checked, nor the suppurative action prevented, we shall generally find that,—whatever perseverance the mother may evince, however desirous she may be to avoid weaning, and however little she may regard the personal pain and inconvenience attendant on suckling, —still she will soon be compelled to discontinue that grateful office, partly from her own health suffering, and partly in consequence of the unthriving condition of her infant. I should recommend, then, in all cases where an abscess is already developed, or in process of formation, that the child should be separated from the breast at once, especially if an opportunity offers of giving it the advantage of a hired nurse; for I am well persuaded that many of the formidable symptoms which we observe in chronic cases of this kind are dependent on the double drain the system is sustaining—from the continuance of the ulcer on the one hand, and keeping up the secretion of milk on the other; and I am equally as well persuaded, that the secretion formed under this state of disease and debility does not possess sufficient nutrient properties to sustain the infant in health. Nor, indeed, is it impossible that pus may pass into its stomach along with the milk it takes, the injurious consequences of which I need not insist upon.

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* All contrivances similar to the breast-pipe or pump are faulty; because, in forming the necessary vacuum, they constringe a large portion of the ducts, through which the milk ought to flow freely.

The practice of allowing the child only to take the healthy breast, and endeavouring to put a stop to the formation of the secretion on the diseased side, is, I think, even more injudicious than continuing it at both; for such a sympathy exists between the organs, that if one is kept constantly in a state of activity, the other will not remain idle; and as more blood will be determined to the affected breast than is required for natural purposes, it is reasonable to infer that the inflammatory disposition will be favoured, and the cure thereby protracted. Independently of this danger, in the weakened condition of the patient, one breast will not furnish enough for the infant's wants: it will be necessary, therefore, to bring it up partly by hand, which in itself is a deviation from nature's intentions, and may sow the seeds of subsequent derangement. For all these reasons, then, I would endeavour to persuade the mother to relinquish the idea of nursing the babe herself, as soon as I became convinced that it was impossible to prevent suppuration taking place.

After a mammary abscess, an induration of the cellular substance of the breast is often left for many months, or even years; and this has led to the apprehension of malignant disease. In no feature does such a swelling resemble cancer, and in no case is it likely to degenerate into that formidable malady, unless there should exist an unusually strong predisposition to cancerous action.

EXCORIATED NIPPLES

Are in themselves perhaps of comparatively little moment, but they are deserving of grave consideration, from the severe pain which accompanies the function of lactation, and the serious inconveniences which are likely to result, and of which I have already spoken. They often, indeed, lay the foundation of mammary abscess, not in consequence of any malignancy existing in the ulcer itself, or the absorption of any poisonous matter carried into the structure of the breast, but merely because the patient will keep the infant almost entirely at the healthy side, and apply it to the tender nipple only for the purpose of obtaining present ease, when the breast is over distended. The organ thus remains always in a state of fulness, the ducts become gorged, and inflammation is consequently excited.

Ulcerations generally commence in the form of a chap, which appears to have little tendency to heal; the skin around the crack is rubbed off by the action of the child's mouth, and soon the denuded surface puts on the character of an ulcer. Sometimes these excoriations are very superficial; at others they eat more deeply into the substance; and I have seen the whole structure of the nipple, and part of the areola, destroyed by a disease which commenced as a simple chap. Such inveterate cases, however, almost always depend on neglect or mismanagement.

Treatment.—There is no more difficulty in curing an ulcer on the nipple than on any other part of the body, provided it be not situated on an inflamed base; nay, as this is a highly-organised structure, we should infer that its powers of repairing injuries were great; and this I think we shall actually find to be the case. But there is great difficulty in preserving it sound when the healing process has been established; and this depends principally, if not altogether, on mechanical causes. When new skin is formed, it is soon rubbed off in the action of sucking, the ulcer re-appears, Nature's benevolent intentions are frustrated, and she has her whole work to begin over again: thus, then, there is a succession of the actions of destruction, on the one hand, and reparation, on the other, constantly alternating with each other.

To perfect the cure, therefore, it is necessary that two points should be kept in mind; the one to favour the healing process, and the other so to protect the tender organ that the newly-secreted cuticle should not again be removed. For the first object the various astringent lotions will be found very efficacious, either of the vegetable or mineral kingdom: such as a strong infusion of green tea, or port wine or brandy mixed with a due proportion of water. The smarting pain, however, which these domestic applications occasion, will perhaps induce the woman to neglect their use, merely because she thinks them of such a simple character, that she cannot understand how they can effect an advantage equivalent to the suffering she endures from their action. Under such circumstances we may persuade her to employ a medicated lotion,—even although its use may be equally painful, —since she will regard it as more efficacious, not knowing its ingredients. Alum, then, or borax, dissolved in rose-water, or in almond mixture, will afford an useful and elegant wash. Should these not answer the intention, sulphate of zinc, or of copper, may next be tried, or the nitrate of silver in weak solution, applied by a camel's-hair pencil. Under the use, however, of these latter salts, particular attention must be paid that the nipple is well cleansed on each occasion before the child is allowed to suck, because, if any, the minutest quantity, of these preparations pass into the stomach, much injury to its health may result.

If we think it right to employ such active agents, it is much better that we should use them in solution, than rubbed down in the form of an ointment, partly because they are more easily and more effectually applied to the diseased surface, but principally because they can be more perfectly washed off when the child requires the breast, and there is less chance of any portion being swallowed. Nevertheless, ointments of a milder kind are sometimes highly useful, such as the common spermaceti. Most nurses, indeed, possess a catalogue of nostrums—never-failing cures—for chapped or ulcerated nipples; and I think many of the most distressing cases of the kind we meet with are occasioned by these busy characters taking the management on themselves: and, as is usual with the ignorant, relying implicitly on the virtue of their favoured *specific* alone, without attending to the necessity either of protecting the nipple, or duly evacuating the breast. The chief, perhaps, are goose-grease, elder ointment, and spermaceti melted with some oily substance, to form an unguent very similar to our own pharmacopœial preparation. Some are in the habit of sprinkling the surface with a mixture of powdered gum arabic and alum, the only objection to which is the likelihood of a part passing into the child's stomach.

But, as I have just said, we shall gain little advantage unless we protect the newly-formed skin from fresh abrasion; and this we shall probably be able to effect by the use of the shield and teat: the restorative process will then be allowed to proceed uninterruptedly. Sometimes, indeed, the child cannot readily obtain nourishment through the instrument, and this often arises from the teat being allowed to project so far beyond the extremity of the shield, that it gets into the back part of the mouth, tickles the fauces, and incapacitates the child from sucking. This may easily be remedied, and in a week or two the shield may generally be discarded. A caoutchouc shield has often been found of service, when the teat has not answered. Whenever the infant is taken from the breast, the nipple should be covered by a metal shield, to be constantly worn; and that kind formed by Dr. Wansbrough,* and now generally sold under his name, I have found more beneficial than any others I have tried.

If the child be allowed to suck a chapped nipple unprotected, it is not improbable that some blood will pass into its stomach, and be rejected by vomiting; and this may cause unnecessary alarm, under the belief that it is dependent on a rupture of infantile vessels. Hæmatemesis I never knew occur during the first few months of life.

Whenever we have the management of a patient during gestation,—especially if it be a first pregnancy, or she have suffered from sore nipples under suckling before, it is right to recommend that an attempt should be made to harden the delicate and sensitive organ by the frequent application of some astringent wash; and a strong infusion of green tea, with the addition of about one-fourth of brandy or rectified spirit, will be found very efficacious for this purpose. Its use should be commenced soon after quickening, and the application should be made at least morning and night for some minutes. Some women will object, from the trouble it occasions, or the slight stain it causes on their linen, or from their thinking it unnecessary, and the danger remote: but the trouble is inconsiderable,—the time required is little more than they would occupy in the arrangement of a single curl, and the advantage likely to result far outweighs any inconvenience it may subject them to; at the same time the nipple should be exposed as often as is convenient to the air. The softness and tenderness of the protecting cuticle, indeed, principally arises from its being covered by the dress from infancy; which keeps it in a state of constant moisture, and prevents it obtaining the benefits which Nature doubtless intended it should derive from the action of the external atmosphere. The most effectual mode of using these applications is by half filling a small wide-mouthed bottle with the lotion, putting the nipple into the mouth, and allowing the fluid to gravitate back upon the breast.

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* See Lancet, July, 1842.

Ulcers are sometimes caused on the nipple by a species of inoculation. If the child's mouth be extensively affected with the common aphthous ulceration of infancy, the nipple will often become ulcerated also, for the cure of which no specific plan beyond what I have just advised is required. But a more serious disease may be produced by a woman suckling a syphilitic infant; and this is most likely to obtain, in the case of a wet-nurse, under whose care such a child is placed. Not only, indeed, may the nipple become diseased, and perhaps destroyed, but the whole system of the nurse may be affected, and the entire train of secondary symptoms may follow in their successive order; of which sad consequences more than one instance has come under my own observation. Besides the peculiar character of the ulcer, the appearance of the child and history of the parents will much assist us in forming a correct diagnosis. I need scarcely say that mercurial remedies are required in such a case, that both infant and nurse should be subjected to their influence, and that sarsaparilla, with the iodide of potassium, will also be found highly useful in some instances. I have pretty good reason for believing, too, that a woman labouring under secondary syphilis may communicate the disease to a previously healthy child whom she suckles for a continuance, although there be no ulcer on the nipple,—merely through the tainted milk taken as a nourishment.

RETRACTED NIPPLES.

When the nipples are retracted they may be productive of the same dangers, from the accumulation of the milk in the lactiferous tubes of the breast, which I have already described as attending on an ulcer of the part. Retraction of the nipple is to be attributed to that reprehensible custom,—the disgrace of civilized society and the fruitful source both of injured health and deformed person in the young female,—tight-lacing. Not only are the intestines, the liver, the stomach, and the viscera of the chest, subjected, by such a fashion, to constant and most injurious pressure, but the bosom itself is squeezed into an unnatural form and smaller compass. The nipple, partaking of the general compression, is flattened with the surface of the breast; it has no opportunity of enlarging and projecting, as Nature intended it should, and it becomes, as it were, lost in the surrounding structures. The growing girl, however, feels no inconvenience from this circumstance; so long as the functions of the organ are not required, so long, perhaps, no notice is taken of the change in form which has gradually occurred; but when she becomes a mother, she looks back with sorrow to the folly of which she has all her life been guilty, and reproaches herself for not having followed the advice of those who were better informed than herself; often, perhaps, tendered, and as often rejected with indifference or disdain.

Treatment.—After every first birth, and in all cases where we have the least suspicion on the subject, it is desirable that, on our first visit subsequent to delivery, we should inquire of the nurse, or examine for ourselves, respecting the state of the nipple; for if it does not possess its due prominence, we must immediately endeavour to draw it out by means of the breast-pump or pipe, so that the child's mouth may be able to embrace it; and our attempts must be made early, because if we delay until the milk has been secreted freely by the glands, the nipple will be retracted into a kind of cup or depression, while the fulness and tension of the breast will oppose our efforts at withdrawing it. If this state be permitted to take place, either inflammation will ensue, or the milk not being evacuated, nature will cease to furnish it; and thus the woman will be incapacitated for performing the office of a nurse. A flattened nipple may sometimes be rendered tolerably perfect by the use of the pipe or breast-pump; and it may further be enlarged by the frequent application of a child five or six months old. But I think we shall not often persuade so old a child to take a strange breast, especially if it requires more effort to get the nourishment, than it is accustomed to use. In such case an adult may be employed to empty the bosom by the mouth three or four times a-day, which at the same time has the effect of drawing out the nipple. In London, as well as other large towns, women may be found who make a livelihood by hiring themselves out for this especial purpose; though all monthly nurses ought to be able to perform such a duty. It is better not, in the first instance, to fatigue the patient by obliging her to support her own infant, for it will neither possess an easy knack of sucking, nor strength enough to retain a firm hold of the nipple. The young infant, then, should be put to an older breast, and the older one to the patient's, provided our object can be attained by it; and after a time she may be allowed to nurse her own. Perhaps the use of a shield and teat may prove advantageous under the circumstances described.

PHLEGMASIA DOLENS

Is one of the most interesting diseases affecting the puerperal state; not merely from the violence of the attendant symptoms, but also in consequence of the diversity of opinions which have been held respecting its nature and origin. This diversity has led to the introduction of many terms by which it has been described, most of them based on some favourite hypothesis; thus it has been called *œdema dolens*, *œdema lacteum*, *dépôt du lait*, *metastasis lactis*, and *crural phlebitis*.

History.—The disease is marked by a general and diffused swelling attacking the lower extremity, hard and elastic to the touch, not retaining the impress of the finger, attended with extreme pain, which is much increased when any movement is attempted, or pressure is applied. The surface assumes a glossy white appearance, and the temperature of the limb is greatly heightened. Punctures or incisions through the integuments give exit only to a few drops of very viscid serum, which readily coagulates, and the depending position of the limb increases, but in a slight degree, if at all, the swelling of the foot and ankle.

It usually occurs between the end of the first and fourth weeks after delivery; its accession has been occasionally earlier,—seldom, scarce ever, later. Mr. White, of Manchester,[*] indeed, informs us, he has known one instance of the disorder showing itself as early as twenty-four hours after delivery, and another as late as five weeks, but he adds, "neither of these are usual;" and

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[*] An Inquiry into the Nature and Cause of that Swelling in one or both of the Lower Extremities, which sometimes happens to Lying-in Women. Second edition, 1792, p. 9. The first edition of this treatise was published in 1784.

Levret[*] remarks, it has been often observed to take place on the child being weaned, beyond the close of a year. This latter observation, however, has not been borne out by more recent authors; and as Levret had a theory to support by his argument, it is not impossible that his zeal might have betrayed him into error. It attacks one extremity only at the commencement, but sometimes the other becomes affected before the disease has subsided in the first; and in no few instances, as the swelling leaves the one, it shows itself in the other. Blundell,[†] Campbell,[‡] and Churchill,[§] state that the left side is more frequently affected than the right. White[||] says, "It attacks women who were delivered on the knee, and others who were delivered on the side; but of those who were delivered on the side, it appears that the greater number were affected on that side on which they lay at the time of delivery." It seems, indeed, the general opinion, that the left extremity is more frequently the seat of the complaint than the right; and I have remarked the same in my own practice. White, from the quotation just offered, appears to attribute this peculiar feature of the disease to the position of the body during labour. It may possibly, in some inexplicable manner, be dependent on the different distribution of the right and left spermatic vein,—the right terminating direct in the vena cava, the left in the renal.

Although no puerperal woman is exempt from the chances of an attack, still those of a debilitated constitution, whose system has been broken by long-continued disease, or who have suffered much from weakening discharges—those also who have gone through a lingering and painful labour, and particularly those in whom profuse uterine hæmorrhage has taken place before or after delivery—are by far most frequently the subjects of this affection. A great proportion of the cases which I have myself seen, have appeared subsequently to large losses of blood during labour.[¶] Merriman,[**] when speaking of placental presentations, incidentally mentions that "he has known phlegmasia dolens follow delivery under such circumstances on many occasions." This perfectly accords with my own experience, and I have attributed the accession of the disease rather to the immense discharge which always attends this frightful case, than to any injury inflicted on the uterus under the operation undertaken for the delivery of the child; or to any predisposition connected with such a peculiarity of placental attachment. It is said to have followed an abortion;[*] though I have myself never seen a well-marked instance of such an occurrence. Mr. White[†] makes a similar observation. He also says he never knew it happen to a woman more than once. I have never known it attack the same limb twice; and this is easily accounted for, if the chief vein in the thigh be obliterated. But I have seen some instances where, after a subsequent confinement, pain and *slight* œdematous swelling have occurred in the extremity previously affected with phlegmasia dolens.

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[*] L'Art des Accouchemens, 1761, p. 168.

[†] Obstetricy, by Castle, p. 786.

[‡] System of Mid. 1833, p. 371.

[§] Midwifery, 1842, p. 462.

[||] Op. cit. p. 11.

[¶] "In several cases we have witnessed it to follow severe and extensive uterine hæmorrhages; and were we to decide from our own experience as to the frequency of its occurrence after any one condition of the system, we should say it was more apt to follow severe uterine losses of blood, than any other single cause."—Dewees, Diseases of Females, Philadelphia, 1833, p. 492. "Phlegmasia dolens frequently occurs in exhausted states of the constitution from hæmorrhages and long-protracted fevers."—Davis, Med. Chirurg. Trans. vol. xv. p. 455

[**] On Difficult Parturition, 1820, p. 126.

If the disease be allowed to run its course, uninterfered with, it will be of uncertain duration. In some instances the patient may be convalescent in a few weeks: in others, and more frequently, many months, or even years, will elapse before recovery is complete. The acute symptoms in such case subside, though the limb continues more or less swollen; and occasionally it has never recovered its former size throughout the remainder of life. As the patient progresses towards convalescence, small, indurated swellings are often observed on the inside of the thigh, calf, and ham; these have been regarded as enlarged glands, but they are now generally supposed to consist of effused lymph; and in no few instances the superficial veins of the leg and thigh, with those on the lower part of the abdomen, have become much enlarged as the acuteness of the complaint has subsided; and have continued varicose for many months. A fatal termination is comparatively rare; but patients have sunk under the violence of the febrile paroxysms, from mere debility, from gangrene in the affected limb or other parts, and in some few instances from suppuration. I have never known an abscess formed in the cellular structure of the diseased leg. White[‡] also states, that he never knew it suppurate; but Haighton[§] observed a succession of abscesses in the limb; and Hull[‖] speaks of it as terminating occasionally in the same manner. Pus has been found by various observers in the hypogastric and uterine veins, in the pelvic cavity, and in the structure of the uterus itself.[¶] In one case which terminated fatally under my care, the whole integuments of the calf sloughed, and the gangrenous disposition seemed to arise principally from distension.* The leg had acquired a size almost equal to the circumference of the woman's body; the skin of the calf cracked in various places; these points became sloughy, enlarged, and coalesced, and death rapidly followed.

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[*] Denman, chap. xix. sect. 3; Burns' Principles of Mid. 1820, p. 541; Dewees, Diseases of Females, p. 471, who says he has seen two instances.

[†] Op. cit. p. 11.

[‡] Op. cit. p. 11.

[§] Blundell, by Castle, p. 788.

[‖] Essay on Phlegmasia Dolens, 1800, p. 139. See also Trye, p. 64.

[¶] Lee, on the most important Diseases of Women, 1833, cases 38, 39, 41, &c.

Phlegmasia dolens is by no means confined to puerperal women, nor, indeed, entirely to females; a disease, at least attended with all its peculiarities and characteristic symptoms, and dependent on the same immediate cause, has frequently been observed in women, consequent on the sudden suppression of the menstrual secretion, and accompanying malignant disease of the womb.† In the male sex it has been known to attend on dysentery, to follow diarrhœa when ulceration of the intestines and disease in the hæmorrhoidal veins existed, and to supervene on cancer of the rectum.‡ It has also originated in external injuries,—a blow on the shin has produced it; it has followed ulceration of the leg,—operations, especially on the veins,—and the local exposure of the limb to cold. Mr. Trye, of Gloucester,§ mentions that he has seen a disease, with all the features of phlegmasia dolens, appear in a person who had suffered greatly from retention of urine and inflammation of the bladder. In one instance I knew it appear a short time before death, when there was a skirrhous prostate and diseased bladder; and both White‖ and Hewson¶ speak of a disease similar to phlegmasia dolens occurring independently of the puerperal state. The latter physiologist, indeed, cites two cases in which it seemed consequent on suppressed menstruation, but "where there was no other symptom of ill-health." Dr. Tweedie** has treated many cases of a disease similar to that under consideration, which occurred "during the progress of, or convalescence from fever," at the London Fever Hospital. All the patients, except one, were females; the complaint in all attacked one of the lower extremities only; and in all active depletion had been employed in the treatment of the precursory fever;

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* For a similar case see Hevin's Cour de Path. et de Ther. Chirurg.

† Lee, Op. cit. p. 152 et seq. See a case by Dr. A. T. Thomson, of well-marked phleg. dolens occurring in a woman, æt. 22, without any symptom of uterine disease, in Lancet, July 6th, 1839, p. 538. See also Hewson, Exp. Inq. part ii. p. 197. A lady from whose uterus I removed by ligature a very firm, fibrous tumour, as large as a common-sized orange, in July 1849, and who had returned to her drawing-room, was seized, fourteen days after its separation, with rigor, fever, and pain in the left groin, which was followed by a well-marked attack of phlegmasia dolens of the same side. The leg acquired twice its proper circumference; and confined her to the house for six weeks. It eventually got quite well, though it has never again become as small as the other. (Med. Times and Gazette, Dec. 4th, 1852, where the case is briefly reported.)

‡ Lee, p. 163.

§ Essay on the Swelling of the Lower Extremities, incident to Lying-in Women, by Charles Brandon Trye, 1792, p. 45.

‖ Page 55.

¶ Exp. Inq. part ii. p. 197.

** Ed. Med. Journ. vol. xxx. p. 258.

and Dr. Cheyne[*] has noticed, among the sequelæ of fever, "an affection not confined to the female sex, resembling phlegmasia dolens." Nor is its seat confined to the lower extremities; the arms have become affected both in men and women, particularly, however, in females suffering from carcinoma of the breast; under which circumstances I have myself seen it. Dr. Ferriar[†] observed it in the arm of a male; and Dewees[‡] also saw it attack the arm of an elderly gentleman whose shoulder had been much injured by the overturning of a coach. I deem it unnecessary to multiply examples, which might easily be done.

Proximate cause.—The phenomena attendant on phlegmasia dolens have been referred to many causes: it has, however, generally been attributed to inflammation of some of the tissues of the affected limb. Mauriceau,[§] indeed, the first author who makes any particular mention of the disease, (for the vague accounts in all previous writers are highly unsatisfactory,) thought it originated in a retention of those humours which should flow away with the lochia, and their reflux upon the extremity. He evidently felt a hardened cord at the upper part of the thigh, but considered it the nerve. This hypothesis was generally followed till the middle of the last century, when Puzos[‖] and Levret[¶] gave its history and their opinions of its immediate cause. These physicians considered that it depended on a metastasis of milk from the breasts to the leg. Mr. White believes that "the proximate cause was an obstruction, detention, and accumulation of lymph in the limb: that the disorder was local, and had a local cause; that the obstruction was occasioned by some accident happening during the time of labour, or some state peculiar to child-bed;" and that this accident consists in one or more lymphatic vessels being pressed upon by the child's head during labour, to such an extent "as to stop the progress of the lymph;" so that the vessel, being surcharged, "must at last burst, and shed its contents." He goes on to say, "that in some constitutions the lymph which escapes out of the orifice will be absorbed again without creating any disturbance in the system;" while in others this fortunate occurrence will not take place, but the peculiar symptoms will develop themselves, and "the lymph, though a very innocent fluid, when circulating within its own vessels, may become much otherwise when stagnating out of them."

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[*] Report of the Hardwicke Fever Hospital.

[†] Med. Hist. vol. iii. p. 92.

[‡] Diseases of Females, p. 471.

[§] Paris, 1721, 4to. livre iii. chap. xx. p. 446.

[‖] Mémoire sur les dépôts laiteux, 1759. M. Puzos died in 1753, and this memoir was published, together with his other works, by M. Deslandes, in the year stated.

[¶] L'Art des Accouchemens, chap. iii. sect. 7.

Mr. Trye considered the proximate cause to be *inflammation* of the femoral and inguinal *lymphatic glands*, occasioned by pressure during labour, by the absorption of acrimonious discharges from the vagina, or by inflammatory action commencing in a lymphatic vessel and spreading upwards to its proper gland; and he supposes that the enlargement and induration of the gland prevent the passage of the fluid through it, and cause its effusion into the cellular structure of the limb.

Dr. Ferriar looked upon the disease as seated in the absorbent system, and considered it inflammatory. Denman* thought that "the glands and lymphatics of the limb were evidently the parts first and principally affected." But from his recommending stimulants and opium, even at the onset of the complaint, we cannot suppose that he regarded it as originating in inflammation. Caspar's† opinion is, that it consists in inflammation of the absorbents; with, in some cases, a simultaneous affection of the cellular tissue; and Dewees,‡ that it is "inflammation of the white lymphatic vessels of the cellular membrane of the several textures of the limb." Dr. Hull § could not believe that the lymphatics alone were affected, and considered that the proximate cause consists in "inflammation of the muscles, cellular membrane, and inferior surface of the cutis, extending in some cases, perhaps, to the large blood-vessels, nerves, lymphatics, and glands;" and that, in consequence of this diffused excitement, serum and coagulable lymph were suddenly thrown out into the cellular texture. Although, according to this (to use the significant phrase of Dr. Davis) *capacious* theory of Dr. Hull's the phenomena were attributed to inflammatory action, still we are left in the dark as to what excited this inflammation *ab initio*, or in what particular part the disposition first showed itself.

It has been attempted, of late years, to clear up this difficulty; and to my late colleague, Dr. David Davis, we are indebted for establishing, I think on pretty sure grounds, the theory that the *venous system* is the part first affected. He read an essay, in May, 1823, before the Medico-Chirurgical Society,‖ in which he contended that phlegmasia dolens depended on inflammation in the iliac and femoral veins. Four months, indeed, before this date, M. Bouillard had related some cases in the *Archives de Médecine*,¶ which demonstrated that the femoral veins were diseased to a considerable extent, and their canals wholly or partially obliterated. He stated, in terms not to be misunderstood, that he looked upon an obstruction in these veins as the cause of the affection. Notwithstanding the priority of publication must be conceded to Bouillard, there is no question that the view which Dr. Davis took of the disease originated entirely with himself; for a dissection of one of his patients, performed by Mr. Lawrence, so early as the year 1817, first seems to have called his attention to the subject, and I know his opinions were broadly stated by him long before his paper was submitted to the Society. Dr. Robert Lee* has even gone a step farther than Dr. Davis: he has applied himself towards elucidating the morbid anatomy and pathology of the disease, with his usual perseverance; and he has not only confirmed all that Dr. Davis had previously advanced, but has even traced the inflammation extending into the uterine branches of the hypogastric veins. He presumes it originates in these latter vessels, and, spreading into the common iliac, external iliac, and crural veins, produces all the subsequent symptoms; and he accounts for the comparative frequency of the affection in the puerperal state, because the orifices of the uterine veins, being opened on the separation of the placenta, a communication is indirectly established between the venous system and the atmospheric air, in a manner somewhat analogous to what takes place in amputations, and other extensive wounds.† Velpeau‡ adopts the conclusion that this acute swelling of the limb may be ascribed, in some instances at least, to inflammation of the pelvic symphyses, as well as of the veins. Campbell§ considers it "an effusion of lymph into the cellular membrane, in consequence of the obstruction experienced by the venous blood in its transit from the limb towards the heart." While Rigby‖ states the proximate cause to be "obliteration of the lymphatics, whether from inflammation of the adjoining vein, or of the layer of cellular tissue through which they pass;" and says, "As it is almost invariably preceded by symptoms of puerperal fever, many of its early symptoms will differ but little from that disease."¶ In this latter remark, Dr. Rigby follows Hull,** Le Gallois, Busch, and Ferguson;†† but with it I can by no means coincide; for although this disease is usually attended with some uterine irritation, and even though it originate in inflammation of the uterine veins, it is certainly neither preceded commonly, nor accompanied by that train of morbid phenomena which are generally regarded as characteristic of puerperal fever. Besides which, the commencement of the attack is almost always later after delivery than that of puerperal fever; and I cannot regard the cases published, which are supposed to prove the identity of the two diseases, as cases of genuine phlegmasia dolens.* My own opinion is, that the immediate cause of the swelling of the limb is inflammation and obliteration of the crural vein; which may have commenced in the uterine sinuses, and have travelled along the uterine vein, the common and external iliac; or which may have originated in either the crural or the iliac vein itself.

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* Op. et loc. cit.

† Comment. de Phlegmasia alba dolente, Hallæ, 1819.

‡ Diseases of Females, p. 490.

§ An Essay on Phlegmasia Dolens, Manchester, 1800.

‖ Vol. xii. p. 419, 1823.

¶ Tom. ii. p. 192, January, 1823.

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* Op. cit. p. 116.

† Med. Chirurg. Trans. vol. xv. p. 400.

‡ Researches et Observations sur le Phlegmasia alba Dolens. Archives générales de Médecine, tom. vi. 1824.

§ Mid. p. 370.

‖ Lib. of Mid. vol. vi. p. 300.

¶ Page 296.

** Op. cit. pp. 227—235.

†† Diseases of Women, part i. p. 29, who considers it "only puerperal fever, modified by its locality."

Morbid appearances after death.—The state of the parts after death exhibits various appearances, according to the violence of the disease, the length of its duration, and whether itself has produced the fatal termination, or the patient has fallen a victim to some other morbid actions. Little or no serum has generally exuded from the extremity on incisions being made. The crural and iliac veins have sometimes, when the attack was remote, been found perfectly obliterated, having been converted into ligamentous cords by lymph effused into their tunics, and having become strongly adherent to the sheath and cellular substance enveloping them. In more recent cases, the vessels have been diminished in capacity by a thickening of their coats, and the formation of an adventitious membrane adhering firmly to their internal surfaces; strong, solid, deep-coloured coagula have also in most instances been observed, distending the canals, under such a state of inflammation; and the lining membrane has been of a dusky-red or bright-scarlet hue. The uterine plexus of veins, too, has generally been blocked up with firm red coagula. The vena cava has in some instances partaken more or less of the peculiar appearances evident in the iliac veins. The iliac glands have sometimes been observed converted into abscesses, or enlarged and inflamed; collections of pus have been found in the cellular structure of the pelvic cavity, or in the substance of the uterus; and in such cases, independently of a narrowing of their canals, and other marks of inflammatory action, pus has been found in the hypogastric, common iliac, and femoral veins. In two cases of death which came under my own care, the veins of the pelvis and thigh were extremely diseased: in that already alluded to, where sloughing occurred, the internal iliac and femoral were obliterated, and converted into a ligamentous tissue; in the other, the cellular substance surrounding the hypogastric was inflamed and thickened, and the canal rendered totally or nearly impervious by a thick plug of whitish fibrine: the same appearances showed themselves also in some of its communicating branches.†

It would appear probable that in phlegmasia dolens the disease is essentially phlebitis; but that the inflammatory condition is confined to the cellular tissue of the vein and to the middle coat, terminating in the effusion of plastic lymph into the structure of the vessel. Or the internal membrane being also implicated, successive layers of coagulable lymph are deposited on its inner surface; and the accumulation of solid matter thus secreted, together with the thickening of the middle and external coats, and the coagulation of the blood contained within it, gradually block up the cavity, and convert into a solid cord what was originally a pervious canal. If the inflammatory action commences in the internal membrane, and its violence is so great as to issue in the formation of pus, the puriform secretion will mix with the blood, poison the system, and give rise to typhoid symptoms; but if, instead, solid lymph is deposited between the coats and in the cavity of the vessel, those phenomena will be developed which constitute *phlegmasia dolens.*[*]

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* See Ferguson, op. cit. pp. 245—247.

† I would refer my readers to the 15th vol. of the Med. Chirurg. Trans. for two plates illustrative of the disease in question being dependent on inflammation and

Symptoms.—The symptoms of this disease have already been glanced at, while treating of the history. It is usually ushered in by shivering, mostly of an aggravated character; to the rigor succeeds deep-seated pain in the hypogastrium and loins, which is soon referred to one or other groin. In the course of a few hours, swelling takes place—the upper part of the thigh being generally first affected—and the intumescence travels rapidly downwards. More rarely, the calf swells before any other part, the regions above and below quickly participating, until the whole limb, from the groin to the toe, is increased very considerably in circumference. As the disease advances, the labium pudendi and buttock of the diseased side generally assume the same morbid appearance. The swelling is of a peculiar character; it is hard, elastic, and although it yields somewhat to the impress of the finger, no pit or indentation is left when the pressure is removed. Its surface is white and shining (which is attributable to the distension the cuticle suffers), and the temperature of the whole member is much augmented. It is seldom in the early stage that any perspiration is visible on the skin of the affected limb. As soon as the least enlargement takes place, a firm, exquisitely painful cord may usually be detected, running downwards from the upper part of the thigh; which has been mistaken for the nerve, and also for inflamed absorbents, but which recent dissections have satisfactorily demonstrated to consist of the indurated and thickened femoral vein. In some

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obliteration of the crural veins; as well as to Dr. Hope's work on Morbid Anatomy for another; taken from cases which occurred in Dr. Lee's practice.

[*] See a good paper on phlegmasia dolens, by Mr. Anderson of Manchester; read before the Manchester Med. Soc., and transcribed into the Lond. Med. Gazette, March 7th, 1835; in which he expresses an opinion, similar to that put forth in the text.

instances, though comparatively rarely, the inguinal glands may be felt enlarged. Acute pain in the limb precedes and attends its increase in size, very much aggravated by pressure, especially in the ham and along the course of the femoral vein; so that often the gentlest touch can scarcely be borne. Any change in the position of the extremity is also attended with increased suffering, and the patient is incapacitated from moving it of her own will, not only in consequence of the agony such an attempt occasions, but also from actual loss of power over the muscles themselves. The most easy posture is with the limb flexed both at the hip and knee joints, the trunk being turned a little towards the disabled side.

If the patient is progressing favourably, the violence of the pain gradually abates; it becomes of a dull, heavy, and gnawing kind, or the limb is more or less benumbed, while it still continues enlarged and hard. In process of time, however, the solidity disappears, the skin over the tibia, as also the instep and ankle, begin to "pit on pressure," and the whole member assumes the character of common œdema. I consider this softening one of the best local symptoms that can appear.

Such an extensive disease cannot be expected to exist in any part of the body, without very considerable general derangement. The pulse is very quick and feeble, often mounting to 130 or 140; the countenance pale, leucophlegmatic, and expressive of distress; the tongue furred and moist; the bowels mostly constipated; the urine scanty and turbid: there is thirst, headache, want of sleep, and other indications of pyrexia, varying in degree; occasionally vomiting; and the febrile affection sometimes puts on an irregular, remittent, or intermittent form. Sometimes excessive perspiration over the whole body is observed from the very commencement, which tends to weaken the patient most materially. The lochia are generally suppressed; or, if still flowing, become changed and fœtid in character. Should, however, the disease not make its appearance till nearly a fortnight after delivery, which is, perhaps, the most usual time, the lochial discharge will have almost entirely ceased to flow previously to the attack. As the pain abates, the febrile symptoms also disappear; and excessive languor and debility supervene. Should suppuration or gangrene take place, the accompanying fever assumes the typhoid type, and the patient will most probably sink under her protracted sufferings.

Diagnosis.—This affection may be distinguished from œdema by the hardness, pain, and fever attending it, and by its not showing itself till some time after delivery.

Prognosis.—Our prognosis may, in the great majority of cases, be favourable, and should be regulated partly by the size the limb has attained, but principally by the violence of the febrile paroxysms. The disease seems to bear a more dangerous character now than formerly; for Mr. White tells us he never saw it terminate fatally; and in another passage he says, it will be difficult to determine the remote cause, until proved by dissection; "and it may be a long time before such an opportunity offers, as this disorder has *never been known* to prove fatal."* This difference, indeed, with regard to the termination, induced the late learned Editor of the Medico-Chirurgical Review † to withhold his assent from Drs. Lee and Davis's opinions, and to consider that the cases which came under their observation (where death occurred, and dissection proved the changes that had taken place in the veins), were not true specimens of the disease, as described by Hull, White, and other observers. Denman, however, mentions that he had seen one instance, and heard of several others, in which a fatal termination occurred, where no other cause of death could be assigned or suspected; but he seems to attribute the event to extraordinary exertions which the patients were urged to make; for they sank either under some great effort, or immediately after.‡

Treatment.—As the disease originates in local inflammation of an acute kind, we might perhaps be inclined to have recourse to free depletion for its cure; but as, on the other hand, it generally attacks a frame previously debilitated, either by long-continued indisposition, the loss of blood, or some other depressing action, there are but few cases in which, even at the onset, we should dare to take blood largely from the arm; and we shall find more advantage from the application of sixteen or twenty leeches to the hypogastrium, the groin, and the upper part of the thigh, on the first accession of pain, whether the swelling has commenced or not. I have myself seen many instances in which I am persuaded phlegmasia dolens was arrested at its commencement by free leeching being promptly had recourse to.§

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* Op. cit. p. 43. † Vol. xxiv. p. 469, 1836. ‡ Chap. xix. sect. 3.

§ In the middle of July, 1831, I attended a lady of her first child, whose labour was very lingering, and frightfully painful, in consequence of a narrowness of the pelvis throughout its whole extent. The child was born dead. Early on the third morning she was attacked with rigor, followed by uterine inflammation, which, however, was soon subdued; and in a fortnight she was well enough to be walking about her chamber. On the seventeenth day after her delivery, her husband returned home unexpectedly early; she ran out of her room to meet him, and, as the weather was excessively oppressive, sat in the ante-room with him for some time, never having before left her bed-chamber since her confinement. Late the same evening, she was seized with acute pain in the left iliac region, attended with stiffness, weight, and dragging at the groin, an almost entire inability to move the limb, and all the incipient symptoms of phlegmasia dolens. When I saw her early the next morning, she was suffering exceedingly; all the neighbourhood of the left groin was exquisitely tender, and, as well as the upper part of the thigh, was slightly swollen. Pressure produced so much pain, that I was deterred from examining accurately, to ascertain

But we need not trust to the agency of leeches alone, although we may think it necessary to repeat them. We must also procure early evacuations from the bowels; we shall find however powerful cathartics generally injurious. Small doses of calomel, or other mercurial preparations, combined with antimony or Dover's powder, and mild purgatives, are of much benefit. It is of the utmost importance that we should procure ease and sleep, and that we should act, if possible, on the liver, the kidneys, and the skin. Warm anodyne fomentations to the limb will often be useful, or a tepid spirituous lotion; but I think more relief is obtained by wrapping it in a fold of new flannel, and enveloping the whole in oiled silk, which seems to be beneficial by exciting local cutaneous perspiration. Prof. Jennings, of Baltimore,* recommends, from experience, strips of adhesive plaster, spread with mercurial ointment, to be applied over the entire limb: these he covers with pieces of oiled silk neatly fitted, and a bandage sufficiently tight to keep the dressings close, but not to give pain.

When the affection has existed some days, and the pain still continues, advantage may be gained by four or six leeches, every second or third day, applied in the track of the femoral and popliteal veins, and the local vapour bath, in addition to the other means just devised. And in its more chronic stage, when the pain and venous inflammation have entirely subsided, frictions, with or without stimulant embrocations, and a properly adapted bandage, are of essential service. I need scarcely insist on the leg being preserved, as much as possible, from the dependent posture, until recovery is complete. Mr. White found blisters to the upper part of the thigh and groin useful. Mercurial frictions, digitalis, and iodine, seem injurious rather than beneficial. On the whole, when extensive tumefaction has taken place, we may consider the case very much removed beyond the immediate power of medicinal agents; and for the purpose of effecting a cure artificially, we should depend principally on local abstraction of blood at the very onset of the disorder.

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whether the vein was distinguishable. A number of leeches were immediately applied, which bled so profusely as to cause three or four attacks of perfect syncope, and greatly to alarm her attendants. The pain was removed, but phlegmasia dolens appeared in a well-marked, though exceedingly mitigated form, and confined her to her chamber another month; nor did the swelling, hardness, and stiffness, disappear for many weeks afterwards. I have no doubt that the large local loss of blood saved her from a protracted, and, probably, a serious disease.

* United States Med. and Surg. Journal, Oct. 1835.

ŒDEMA.

It is very unusual for common œdema of the lower extremities to occur after the birth of the child, unless such an affection had existed previously to labour; and, indeed, even should it have annoyed the patient during pregnancy, it usually soon disappears, unless there be present also water in the abdominal or thoracic cavities. The marks already noted will sufficiently discriminate it from the disease of which I have just spoken; and it requires no particular plan of treatment for its relief.

PARALYSIS

Of one or both legs, in very various degrees, occasionally happens after labour; more frequently when the process has been tedious and painful, but sometimes when it has been of ordinary duration, or even unusual rapidity. If not attended with cerebral affection, it is dependent on the pressure which the muscles and nerves have sustained during the passage of the child's head through the pelvis. There is pain, or numbness, both within that cavity and around the hip, and an inability to move the limb with freedom. It generally disappears by degrees within a few days; at other times it continues beyond the period the patient commonly remains in bed, and compels her, when she rises from it, to use a stick or crutch. Fomentations in the first instance, and afterwards stimulating embrocations, a *douche* or shower-bath, tonic medicines, and gentle movement of the limb, will offer us the best chance of success. Hemiplegia, indeed, may appear after delivery as well as at other times; but there will then be particular symptoms, independently of the local affection, which are too well known to require mention from me here.

Sometimes, especially after a first and protracted labour, pain will be experienced for some days on the evacuation of the rectum, occasioned probably by the stretching of the coccygeus muscle, which always must take place to a greater or less extent during the exit of the head. This requires no particular management; and I merely mention it that it may not be supposed that every painful sensation which the woman experiences in the neighbourhood of the anus, after such a birth, is dependent on inflammatory action.

MILK FEVER.

There is generally apparent some little excitement in the system about the time when the milk is being first secreted, the mammary glands then usually being in a state of great activity; and this leads us to recommend a moderately strong aperient on the morning of the third day after delivery. But occasionally this excitement is carried beyond the ordinary bounds, and a high degree of fever accompanies the newly-established action, producing much distress. Milk fever, indeed, is, in the present day, comparatively rare; and this may be attributed to the improved method now followed of treating puerperal women in general.

Milk fever is more frequent after a first birth; it is for the most part ushered in by shivering, and attended with increased heat of skin, headache, quick pulse, furred tongue, pain in the back and limbs, and the principal features of pyrexia, together with pain, tumefaction, and hardness of the breasts. The febrile paroxysm is seldom of long duration, but soon disappears with a copious perspiration, on the accession of which the patient falls into a sound sleep, and awakes relieved and refreshed. At other times the hot stage continues longer, and is even occasionally attended with no slight degree of delirium. Inflammation of the mammary glands sometimes accompanies this undue excitement, and abscess supervenes. More frequently the attack subsides without either local or more general mischief.

Diagnosis.—It is of much importance that we should discriminate between milk fever and other more dangerous febrile affections incidental to the puerperal state; and the condition of the mammæ will be our leading diagnostic mark. In most, if not all the other fevers occurring soon after delivery, the milk is either not secreted at all, or in very sparing quantity; and even should the breasts have become distended, it quickly ceases to be formed. On the contrary, however, when the undue excitement is dependent on increased determination of blood to these organs, instead of their being preternaturally flaccid, we observe them highly tumid, and evincing every characteristic of fulness. It cannot be necessary for me to draw a distinction between the affection we are now considering and peritonitis, or any other puerperal disease; for, independently of the particular symptoms they each possess, this single mark is so palpable and easily recognised, as to lead us at once to a tolerably correct conclusion.

Treatment.—The best prevention of milk fever is the early application of the child to the nipple, so that the secretion should not be allowed to stagnate in the ducts. But we shall often find nurses much averse from putting the infant to the breast soon;—we are told that "the poor little creature sucks nothing but wind," and are entertained with a multiplied farrago of nonsensical excuses. We may generally discover that the nurse's object is to save herself trouble, and she therefore gorges it with artificial food till it is both unwilling and unable to suck. Not to insist on the dangerous tendency of such a practice to the child, its being allowed to take the breast within ten or twelve hours after delivery, helps to draw the nipple out, and prevent future inconvenience. Besides this, the first-formed fluid possesses in some degree a saline property, which acts slightly as a stimulant to the intestinal canal. As a principle, therefore, whenever there is an indication of the new function being commenced by the glands, we should insist upon the necessity of the supply being used as Nature in her beneficence ordained that it should.

Even if the fever of which I am now speaking has already set in, little is required to be done beyond emptying the bosom, moderating action by aperient and saline medicines, keeping the patient upon low diet for a day or two, regulating the temperature of her apartment, obliging her to breathe a cool and pure atmosphere; and should local symptoms of mammary inflammation develop themselves, controlling these by the means before recommended.

EPHEMERA, OR WEED.

This is a name given to another morbid affection of the puerperal state, rarely met with in London, more prevalent in low, marshy, and thinly-populated districts: and especially likely to appear in cold moist weather: it consists, as the term *ephemera*[*] implies, of a fever not exceeding one day's or twenty-four hours' continuance; it generally appears within a week after delivery,—is ushered in by a rigor, to which succeeds a paroxysm of febrile heat, and is terminated by profuse perspirations. When I have met with this disease, it has almost always been among the indigent living in the suburbs of the city, where stagnant ditches intersect the houses, or where the dwellings themselves have been raised upon ground newly formed by rubbish thrown into shallow pools,—such as the space now called Waterloo Town, in the vicinity of the London Hospital, and the district northward and eastward of Shoreditch church.

Symptoms.—The shivering is generally very intense and of long continuance; and in proportion to its violence will also be the intensity of the hot, and duration of the sweating stages. The cold fit is accompanied by great depression; pain in the back, limbs, and perhaps in the head; shrivelled features; sunken eyes; harsh, dry skin, with lividity and corrugation of the integuments, at the extreme ends of the fingers; preternatural heat of the general surface, although the patient complains of excessive chilliness; feeble, indistinct, perhaps intermittent, and somewhat accelerated pulse; and sometimes nausea. As the rigor abates, the dry heat of the surface throughout the body is increased; the pain in the head is more distressing, and is referred principally to the forehead and eye-balls; the temples throb; the face is flushed; the mouth is parched; the breasts are tender; the tongue becomes soon furred; the pulse is more regular, harder, and firmer; the secretions of the kidneys, mammæ, and other glands are in a great measure suppressed; the lochia for a time cease to flow; there is excessive despondency, even to a fear of immediate dissolution; and not unfrequently delirium. After an uncertain period these symptoms gradually give way: the heat of the body abates; the skin becomes more supple and soft; a moisture breaks out, appearing first on the forehead, neck, and chest, which is soon converted into a profuse perspiration that pervades the whole person; the pulse is slower, fuller, and softer; the breathing freer and more natural; the headache ceases; the mouth becomes moist; the other secretions are restored; the urine throws down a copious sediment; the mind regains its tranquillity; the patient falls into a slumber, and awakes comparatively well, though much exhausted.

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[*] 'Εφημερος, in diem vivens.

In the detail of these symptoms we cannot fail to recognise great similarity to a common fit of the ague, and indeed the disease resembles the attack of an intermittent fever in every respect, except its return; it is most frequent in aguish countries, and is excited by similar causes; and I have seen what appeared to be weed in the first instance settle down into confirmed ague.

Diagnosis.—It will be often difficult to distinguish this affection during the continuance of the first and second stages; it may easily be confounded with the more fatal diseases of the puerperal state; but the violence of the rigor itself will generally be sufficient to indicate its nature. It is seldom that the inflammatory fevers after childbirth,—dangerous as they are,—are ushered in by that severe, long-continued, and intense shivering, which marks the invasion of ephemera, and constitutes a part of the disease; while upon the accession of perspiration, so profuse as is observed in the case under consideration, doubt can scarcely exist longer.*

Prognosis.—If no injury have happened during labour, and there be no reason to suspect organic disease, our opinion regarding its termination may be favourable; the principal danger, in my opinion, being the chance of its transformation into a settled intermittent.

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* The perspirations in this complaint differ most materially from those that occur in the disease, hereafter to be noticed under the term *hidrosis*, although perhaps equally profuse; because here they bring immediate relief to all the symptoms, while in hidrosis, they are attended with increased distress.

Treatment.—Of the treatment little need be said. It should be our endeavour to cut short the cold stage, and excite the perspiratory action as speedily as possible. With this intention, acting on the same principles which guide us in ague, we should, during the continuance of the rigor, add to the covering of the body, apply warm flannels to the pit of the stomach, place bottles, filled with warm water, to the feet and under the axillæ, and give warm diluents internally. An emetic might be attended with benefit. In the second stage, we should cautiously lessen the number of bed-clothes, as well as the temperature of the apartment, exhibit moderately cool drinks, and saline and diaphoretic medicines; and when the third stage has arrived, cordials and gentle stimuli may perhaps be required. As an accession of weed is often excited by loaded bowels, it will be right, should constipation exist, to give (either in the first or second stage) a tolerably powerful purgative, fully to clear the canal; should great depression follow the attack, stimulants may be exhibited; and should there appear indications of a return, bark, in any of its forms, will prove most useful. If the disease continue, and put on an intermittent form, the patient should wean her child, quinine may be liberally given, or even the arsenical solution; and we shall find that removal out of the influence of the surrounding atmosphere, as soon as it can be accomplished with safety, will much assist the other curative means.

MILIARY FEVER.

There is another fever incidental to the puerperal state, rarely met with under the improved method of treatment now pursued after labour, but very prevalent when the heating and stimulating system was followed—*miliary fever.* It is characterised by a copious, minute, vesicular eruption, first appearing on the forehead, chest, and arms, afterwards extending to the whole surface of the body, each vesicle being about the size of a millet-seed; from which circumstance, indeed, the disease has obtained its name. They are distinct, and surrounded at the base by a narrow circle of redness, so thickly spread, that, on superficial observation, the skin has the appearance of being covered by a general blush; but when examined closely, or through a magnifying-glass, the nature of the eruption becomes apparent.

This affection is not confined to the puerperal state; it is most frequently met with in subjects whose constitutions have been weakened by any debilitating causes; and this accounts for its occasionally attacking women after lying-in. It appears sometimes as the sequela of *ephemera.*

Symptoms.—Its accession generally takes place within two or three days after labour. It is ushered in with a smart rigor, which gives way to symptoms of fever, followed, in the course of a few hours, by a profuse perspiration, possessing a peculiarly sour and penetrating odour. There is always great distress manifested in the system. Much oppression and weight about the chest, violent headache, and throbbings within the orbits, are complained of; and the eyes are dull and watery; there is excessive anxiety of mind, and depressed spirits; nausea and perhaps vomiting occur; the tongue soon becomes coated with a white fur, and often the papillæ are eminent, or its margins and tip appear of an unnatural redness, as in scarlatina; occasionally the mouth and fauces become aphthous. The lochial discharge and milk are for the most part suppressed or diminished in quantity. When this feverish paroxysm has continued an uncertain time, a tingling or pricking sensation is experienced on the upper part of the person, which afterwards becomes general. A copious sweat breaks out, which, however, does not moderate the symptoms; a roughness of the skin is apparent to the touch; and soon the eruption shows itself. In two or three days the vesicles have become dry, and the crusts fall off in small branny scales.

Diagnosis.—It may be discriminated from other febrile affections by the eruption; perhaps by the state of the tongue and the oppression at the præcordia; but particularly by the peculiar odour of the perspiration; this is sometimes so strong as to scent every corner of the chamber, and we cannot but be sensible of it on the least raising of the bed-clothes.

Prognosis.—This is seldom a very formidable disease, the principal danger attending it being the sudden checking of the perspiration and the recession of the eruption: when under such circumstances, delirium or coma have supervened, and the patient has rapidly sunk.

Treatment.—In the treatment of miliary fever, very simple means will generally suffice. Our first object is to allow a free circulation of cool air through the apartment; not only to refresh and revive the patient, but also to moderate the perspiration. With the same view, the fire must be kept under and the coverings diminished. All this, however, must be done cautiously, lest a sudden chill should cause a translation of the disease to some internal organ. Attention should be directed to the state of the bowels; they will often be found loaded, and aperients (not of a drastic kind) are called for. Tonic medicines will be found useful, as well during the continuance of the perspiration and eruption as after their disappearance; when the system is left in a state of much languor. Bark, combined with a mineral acid, will, perhaps, be preferable to any other.

PUERPERAL MANIA.

This is one of the most distressing complaints to which child-bearing women are liable; for though seldom terminating fatally, it is often of protracted duration, and attended by circumstances of a peculiarly painful nature. It is not confined to any kind of constitution or rank in life; but those of acute feelings and excitable temperaments are by far more frequently its victims, than others of robust frame and more obtuse sensibilities. It has been remarked by some practitioners, that unmarried women who feel deeply their situation, are oftener attacked with puerperal mania than any other kind of patient.* It appears sometimes during pregnancy, at others soon after labour, and occasionally does not make its first onset until the process has been completed many weeks. There seem to be two periods at which it is most liable to occur; the one when the system has not yet recovered from the shock of labour, the other when it is suffering under the depressing effects of lactation; for that temporary delirium, which occasionally comes on in labour, when the head of the child is passing through the os uteri, or pressing on the perineum, noticed by Montgomery and Churchill,† cannot be called a species of mania. It is the delirium,—the phrenzy,—of high excitement, produced by intense pain. It is neither inflammatory nor maniacal. There are two distinct and well-marked forms of puerperal insanity; the one attended with great excitement and furious delirium, the other characterised by the features of low melancholy. The furious state more frequently shows itself earlier after delivery, and its attack is somewhat sudden; that of despondency is both later in its appearance, and more gradual and insidious in its origin. Of the two, *mania* is certainly the more frequent.‡ There is a peculiar feature sometimes attendant on the commencement of puerperal insanity, seldom or never observed in other forms of mania;—the mind is unsettled, and yet sufficiently sane for the patient to be aware that she is under some strange and uncontrollable delusion. Gooch§ tells us he has seen this affection strikingly assimilate itself to delirium tremens, and has known catalepsy also occur during the progress of the disease. Its duration varies, more or less, in every case we meet with; and its termination is also in a great degree uncertain. Occasionally the symptoms will disappear in the course of a few hours; at other times, months and years will elapse before the mind is restored to its sound condition. As a general principle, the state of desponding melancholy is more lasting than that of more violent mania. It may end in one or other of three ways: either in death, in perfect recovery, or in fixed, settled, and permanent madness. The sooner the attack appears after delivery, the more excited the patient is, the more rapid the pulse, the more perfect the want of sleep, the greater the heat of the body, and the more closely the disease appears allied to an inflammatory state, the more likely is it to terminate fatally. On the contrary, the deeper and more distressing is the melancholy—the more sullen, perverse, and obstinate is the patient—the greater is the chance of its settling down into permanent mania. It is, however, highly consolatory to know that there is little chance, indeed, of the disease becoming confirmed into a continued maniacal disposition. I never myself knew an instance in which this sad result took place; and Gooch [*] mentions that he has observed it only in two cases, and one of these patients had been disordered in her mind before her marriage. The knowledge of this fact must bring us great comfort: and, bearing it in mind, we have the gratifying power of being able to calm and quiet the anxious fears of the husband and friends, by assuring them that, however long the disease may last, there is every probability of an eventual restoration of reason. Thus, we may hold out hopes of a favourable termination of the malady, and that upon the surest grounds — the test of direct experience. Burrows [†] also never met with a patient permanently fatuous from puerperal insanity; and he says,[‡] should "the symptoms approach the character of fatuity, there is generally much delicacy of constitution; or they have succeeded depletory measures injudiciously pursued." It used to be the prevalent, indeed universal opinion, that puerperal mania never resulted in a fatal termination.[§] Even the late Dr. Baillie,[||] observant as he was of disease, and well informed upon the morbid conditions of the body in all their forms, when consulted about a case of this kind, remarked,—"that the question was not whether the patient was to recover, because of that he had no doubt, but how long the disease was to last." She died within a week after this opinion had been uttered. It is very evident that this eminently practical physician had founded his prognosis on the prejudices generally entertained with regard to the termination of such cases, rather than on his own personal observations.

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* Esquirol (Des Maladies Mentales, tom. i. p. 241, 1838), out of ninety-two cases of puerperal mania reported by him, says that twenty-nine occurred in unmarried females.

† Theory and Practice of Mid. 1842, p. 468.

‡ Out of fifty-seven cases noted by Burrows (Commentaries on Insanity, 1828 p. 394) thirty-three were maniacal, sixteen melancholic, and eight alternating.

§ Account of some of the Diseases peculiar to Women, 1829. On the Disorders o the Mind in Lying-in Women, p. 116.

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[*] Op. cit. p. 126. [†] Op. cit. p. 394. [‡] Page 370.

[§] This idea probably originated in the observation of Dr. William Hunter, who in his lectures used to say, "it was a species of madness that usually cured itself." Burrows, p. 397.

[||] Gooch, Op. cit. p. 120.

Another question well worth our consideration, is the probability of a patient becoming the subject of an attack in a subsequent confinement, who had suffered mental derangement after a previous one. The chances are certainly much against such an occurrence, although, indeed, as the former attack proves that a predisposition then existed, and may still be operating, that very circumstance would strongly impress our minds with the *possibility* of a recurrence, and would induce us sedulously to avoid every exciting cause, and to use the utmost degree of care for its prevention, not only in the next, but all the following labours.*

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* Gooch, in the paper from which I have so largely drawn, says, p. 126, "I have attended many patients who came to town to be confined, because they had been deranged after their former lying-in in the country, and, excepting case No. 1, not one of these patients had a return of their disease."

Dr. Montgomery (Dublin Med. Journ., vol. v. p. 64) gives two cases that bear upon this point; one that occurred to his father-in-law, Dr. Connor, of a lady becoming maniacal in eight successive pregnancies; and another of a woman received into Richmond Lunatic Asylum, who was three times similarly affected during gestation; but always became sane a short time before delivery, and continued so until the re-occurrence of pregnancy. Burrows (Commentaries on Insanity, p. 147) says, "Some are insane on every pregnancy; others only occasionally;" and again (p. 378), "Insanity occurs in some contemporaneously with conception, and returns with every impregnation; some become so at various periods of gestation, others at the time of quickening." In June, 1844, I was consulted about a lady whom I had twice before seen under circumstances nearly similar. When within a month of her first confinement she became maniacal, and continued so for three months after: she then regained her reason. She was very well throughout the second pregnancy; but after her labour, a second time became deranged; her illness, however, was of shorter duration than on the former occasion. Her third pregnancy and period of lactation passed over without any symptoms of the kind showing themselves. So also the fourth, until she had suckled her infant for three months; she then fell into a state of melancholy, and some indications of disordered intellect appeared. She was advised to wean her child; and went with her husband a prolonged tour along the coast. I saw her next on the ninth day after her last and fifth confinement. She had then been "flighty" for four days, and was gradually getting worse. For two or three nights previously to my visit she had had no sleep. I found her quite out of her mind, sullen and obstinate; she would neither answer questions, nor do anything she was desired. The bladder was greatly distended, and I relieved it of a very large quantity of urine, which she had evidently allowed to accumulate through perverseness or inattention. She took no notice of her child. That she was sensible of pain as well as of less acute impressions, was evident, because she flinched when pressure was made over the vesical tumour, and struggled and screamed violently while the catheter was being introduced. As the bowels had been freely opened, I put her under the influence of morphia, which had always been productive of benefit in her previous attacks. The next day she had slept well; had passed water voluntarily; answered questions rationally, though with hesitation; and had a more natural countenance. On the day following she was convalescent. From childhood she had been of a nervous and timid disposition; and her father had been for some time deranged, and in confinement.

It is a curious fact that the wife of her husband's brother, not the slightest relation to her, being herself pregnant, and seeing her in her first maniacal attack, was so

Symptoms.—The symptoms of puerperal insanity are so various and diversified, as not to admit of their being recounted within the limits of a treatise of this nature; they are, indeed, very much assimilated to those of mania in its more general form, with the addition of some peculiarities properly belonging to this particular state. A practised eye will frequently detect the accession of mania merely from observation on the countenance and general demeanour of the patient, before any incoherent speech has been uttered,—before the performance of any act which can be singled out as the effect of mental aberration. In mania there is almost always, at the very commencement, a troubled, agitated, and hurried manner, a restless eye, an unnaturally anxious, suspicious, and unpleasing expression of face;—sometimes it is pallid, at others more flushed than usual;—an unaccustomed irritability of temper, and impatience of control or contradiction; a vacillation of purpose, or loss of memory; sometimes a rapid succession of contradictory orders are issued, or a paroxysm of excessive anger is excited about the merest trifles. Occasionally one of the first indications will be a sullen obstinacy, or listlessness and stubborn silence. The patient lies on her back, and can by no means be persuaded to reply to the questions of her attendants, or she will repeat them, as an echo, until all at once, without any apparent cause, she will break out into a torrent of language more or less incoherent, and her words will follow each other with surprising rapidity. These symptoms will sometimes show themselves rather suddenly, on the patient's awaking from a disturbed and unrefreshing sleep, or they may supervene more slowly when she has been harassed with watchfulness for three or four previous nights in succession, or perhaps ever since her delivery. She will very likely then become impressed with the idea that some evil has befallen her husband, or, what is still more usual, her child: that it is dead or stolen; and if it be brought to her, nothing can persuade her it is her own; she supposes it to belong to somebody else;—or she will fancy that her husband is unfaithful to her bed, or that he and those about her have conspired to poison her. Those persons who are naturally the objects of her deepest and most devout affection, are regarded by her with jealousy, suspicion, and hatred. This is particularly remarkable with regard to her newly-born infant; and I have known many instances where attempts have been made to destroy it, when it has been incautiously left within her power. Sometimes, though rarely, may be observed a great anxiety regarding the termination

strongly impressed by her unfortunate condition, that she also became maniacal after her delivery. I was consulted for her, and attended her until she was removed into a private asylum. She remained there for some months; but ultimately recovered completely. She is now quite well; and has never again been pregnant of her own case, or a firm conviction that she is speedily about to die. I have observed upon occasions a constant movement of the lips, while the mouth was shut; or the patient is incessantly rubbing her fingers along the inside of her lips, or thrusting them far back into her mouth; and if questions are asked, particularly if she be desired to put out her tongue, she will often compress the lips forcibly together, as if with an obstinate determination of resistance. One peculiarity attending some cases of puerperal mania is the immorality and obscenity of the expressions uttered; they are often such, indeed, as to excite our astonishment, that women in a respectable station of society could ever have become acquainted with such language.

As the disease gains ground and becomes more strongly rooted, the disturbance of the mental faculties is increased, the pulse becomes accelerated,—in the more violent state, indeed, it is sometimes very rapid,—without much increase in the temperature of the skin, though the head is usually hotter than natural; there is great want of sleep, scarcely the least rest being obtained for many successive days and nights; the tongue becomes coated with a slimy fur; the saliva is scanty and glutinous; the urine small in quantity, and turbid; the other secretions defective, the bowels mostly constipated, and the dejections very offensive; the breath, too, is highly disagreeable generally; and the exhalations from the skin emit a peculiar and unpleasant odour. The lochia are sometimes suppressed, though not universally; but the milk is always more or less deficient, and its nutritive properties diminished.

In the more excited state the patient cannot be restrained, or reasoned with into obedience; she is constantly talking or in motion, attempts to break away from those who have the charge of her, and, unless great circumspection be practised, will elude their vigilance. She may even throw herself from the window; and in two instances, among the poor, I have known the patients run into the street in their night-dress. At other times she will endeavour to destroy whatever comes within her reach, either from revenge, or in apparent sport; and the lives of her attendants are not safe if she becomes possessed of any dangerous weapon. Proffered food is generally rejected; but if she can obtain it furtively, it is greedily and voraciously devoured. She voids her urine and fæces as she lies, not so much from a want of consciousness of their passing, as from inattention, obstinacy, or perverseness.

The state of *melancholia* is characterised by great dejection, fear, and apprehension. There is usually some subject uppermost in the mind, and that is often of a religious nature. The patient speaks of herself as the most sinful creature in existence, and is proportionably despondent in regard to a future state. She sits quiet in one position, perhaps, motionless and mute, taking not the least interest in what is going on around her. At the same time she will answer questions when spoken to, and will probably obey the wishes of the persons in charge of her; but her actions are more like those of an automaton than a living being; she never asks for anything, or expresses any kind of desire; even the calls of nature she will very likely not attend to; she may take food, however, if requested, but generally very little; her nights are sleepless, and she gets no rest by day. There is usually attending this state, a pale, sunken, sometimes a pitiable, though at others a placid countenance; not an unquiet eye; the pulse but slightly accelerated; the skin of natural temperature, or rather below the standard; a want of secretions in general; unhealthy tongue, and constipated bowels; she loses flesh slowly but progressively. It is commonly observed, that in the more violent forms of mania, the propensity to do mischief is indiscriminately exercised against every one around; while in melancholia, whatever injury the patient may attempt is directed against herself.

Causes.—The principal cause predisposing to puerperal insanity may be referred to that undue excitability of the nervous system always in a greater or less degree present during pregnancy, labour, and the chief portion of the process of lactation. In the delicate, refined, and nervous female, whose disposition is more than ordinarily susceptible, this excitability is remarkable to the highest extent; in the persons, then, of such women, whose temperament is strongly contrasted with that of the male, we should eminently dread an accession of the disease. Whenever, also, there exists an hereditary family taint, our minds should be alive to the chance of its developing itself during a confinement. Gooch* says, that of the cases which he had seen, "a large proportion occurred in patients, in whose families disordered minds had already appeared." I have myself made the same remark, and Burrows† tells us above half of eighty lying-in women who became delirious, had an hereditary disposition to insanity.

The exciting causes are both numerous and various; they may partake either of a physical or moral character. We may class among the moral causes, the different passions, particularly those of a depressing kind; sudden and unusual agitation, such as is likely to be occasioned by the patient's becoming abruptly acquainted with the death of a near relative or friend; and alarm, the consequence, most probably, of some real or fancied cause of personal danger either to herself or some one closely connected with her.* Among the physical causes, a disordered state of the digestive organs would seem to bear a prominent place. Weaning has also been enumerated as one, but, in my estimation, without sufficient reason. It is too much the practice among the higher classes of this country, and especially in London, to decline nursing, from motives of convenience. The milk having been copiously secreted, is repelled, and the breasts are never emptied. If the sudden recession of the milk, or the bosoms not being evacuated as Nature intended they should be, were a cause of disordered mind, we should particularly observe it within a few days after labour, when the system is in its most irritable state, and when the generative organs are in an especial degree exerting their peculiar influence over it. But this is far from being the case; mania occurs most frequently, even by comparison, to those who are nursing; and the diminution of the secretion is a consequence induced by the disease. The child, then, is weaned because of the disease;—the disease does not arise from the cessation of suckling. Puerperal mania has occasionally followed large losses of blood from the uterus under labour; hæmorrhage has therefore been considered as a cause.† But in very many instances, which I have seen, no exciting cause has appeared to which it could with any show of reason be referred.

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* Page 127.

† Med. Gazette, Feb. 11, 1832; see also tables in Commentaries on Insanity, p. 391, where, out of fifty-seven noted by him, in twenty-seven there was an hereditary taint. He states also, p. 396, that if the truth could be always discovered, more than half would probably be found to owe their origin to this cause.

Diagnosis.—There are only two cases with which we are likely to confound puerperal mania and melancholia—the one low muttering delirium, the consequence of a continuance of febrile action; the other violent and furious excitement, resulting from phrenitis. The peculiarities of melancholia are so strongly stamped, as to render it unnecessary to mention the distinctive marks between it and these two affections; it indeed is more likely to be confounded, especially at its onset, or in its milder degree, with mere obstinacy or sullenness. In furious mania we are far more liable to fall into error; but when the delirium is consequent on febrile action, the peculiar features of the disease, as they have previously developed themselves in succession,—the dry and raspy tongue, almost always attendant on the last stage of fever, when wandering of the mind is present, and other symptoms too palpable to require mention,—will be in themselves a sufficient means of diagnosis.

To distinguish it from phrenitis is more difficult; as inflammation of the brain, however, generally appears sooner after labour than true mania, the period of the attack will in some degree guide us. The delirium attendant on phrenitis is preceded by fever and pain in the head, of a longer or shorter duration, with vertigo, singing in the ears, and a flushed cheek;—incoherence in manner and expression is often the first symptom observed in mania. Although the pulse in mania be unnaturally quick, it is seldom so hard or sharp as in inflammatory affections of the brain or its membranes. The vessels of the eye under phrenitis are surcharged with blood;—this is not observed in mania; and in the latter disease the countenance acquires a sinister or suspicious expression, easily recognised, but most difficult to describe. Light and sound can scarcely be borne in phrenitis;—they make little unusual impression on the maniacal patient. Inflammatory fever, and increased heat of surface, accompany phrenitis in a high degree;—in mania, the former of these is absent altogether; and the latter, if present, is but slight in intensity. This, indeed, is rather occasioned by the violent exertion that the patient is constantly making than by true febrile action.

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* Esquirol mentions, that out of thirteen cases of puerperal mania in Paris during the alarming crisis of 1814-15, eleven were attributable to terror.

† Burrows, Op. cit. p. 365.

There is one part of this subject that calls for the greatest attention and circumspection—the foretelling from symptoms which show themselves during pregnancy, the probability of the accession of deranged intellects after labour. Nothing can be more dreadful to a husband or friends than the anticipation of such a calamity supervening on delivery; a medical man should therefore be most cautious in hinting at the possibility of such an affliction. Yet there are some indications which strongly point to a probability of the kind; and there are some occasions on which we should not be doing our duty unless we prepared the family for the chance of an outbreak. Burrows* says, "Puerperal delirium consequent on labour is sometimes predicated, though not absolutely developed during gestation. If while pregnant there attend frequent hysterical affections,† preternatural susceptibility, unaccountable exuberance or depression of spirits, morbid aptitude to exaggerate every trivial occurrence, and attach to it great importance, suspicion, irritability, or febrile excitation; or, what is still more indicative, a soporous state, with very quick pulse,—then the supervention of delirium on labour may be dreaded." To these excellent remarks I would add, if a great loss of memory be present, such a result is eminently foreboded. The case of Mrs. Durant, mentioned by Montgomery,‡ is in point. This lady, when six months advanced in pregnancy, received a shock which so completely affected her memory, that after her delivery, and recovery from some degree of mental imbecility which succeeded, she never could recollect any of the events that occurred during the latter part of her pregnancy.

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* Page 366.

† At page 364, he states that he has seen two cases where hysterical symptoms appeared during pregnancy, and the patients almost immediately on delivery became insane.

‡ Signs and Symptoms of Pregnancy, p. 312. Durant's Memoirs of an only Son, vol. i. p. 147.

It is of the utmost importance that we should discriminate clearly between phrenitis and the disordered state of the mind now under consideration; for since in inflammation copious bleedings and free purging are absolutely necessary for the patient's safety, and the liberal exhibition of mercurials and antimony is generally required—and as we shall immediately learn that such practice is injurious under mania and melancholia,—so a mistake might be attended with fatal consequences. Rare as puerperal mania is, phrenitis under child-bed is a still less frequent disease.

Prognosis.—From what I have said it may be gathered that our prognosis may on most occasions be favourable, both in regard to a fatal termination and also with respect to reason being ultimately restored. The sooner after delivery the attack occurs—the quicker the pulse—the more furious the paroxysms,—the greater the danger to life; while the more depressed and desponding the patient is—the longer the time which has elapsed since her confinement—the greater is the chance of the disease dwindling into permanent and confirmed melancholy. As a principle, we may repeat the sentiment of Gooch, "that mania is more dangerous to life—melancholia to reason."*

If I were to select any single sign in a case of mania that had shown itself speedily after labour, as a guide to my prognosis, respecting the probability of death, it would be the rapidity of the pulse. But this should be watched narrowly, and counted often, and for two or three minutes together, for in this excitable state a slight cause will accelerate it, and it is only to a *constant and undeviating rapidity* that this remark applies. If the pulse is gradually increasing in frequency, the patient's state is almost hopeless; but if it as gradually is constantly becoming slower, not only is a fatal event so much further removed; but considerable expectation may be entertained that the disease will soon give way. I should augur well, also, if a large quantity of fœtid fæces were expelled; because I should then hope that the diseased condition of the mind depended on the state of the secretions, and the influence which unhealthy matters pent up in the alimentary canal have upon the nervous system; and I should expect an amendment of the symptoms upon the removal of the cause.†

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* Page 125.

† Esquirol (Medico-Chirurg. Annuaire, 1819) gives of 92 patients admitted into La Salpêtrière, in Paris, during four years, 55 recoveries; Burrows (Commentaries,

In regard to the probable duration of the complaint, respecting which we are always questioned, it is of course very difficult, nay, impossible, to foretell the time it is likely to last; but speaking generally we may say, that melancholia, attended with suspicion

p. 395) tells us, that of 57 patients treated by him, 35 recovered, 11 remained uncured, 10 died, and 1 committed suicide. But these tables give, I think, too gloomy a view of the mortality of puerperal insanity in general; for they do not embrace the mild and short cases. Puerperal patients who become insane are not often seen by physicians that devote their time chiefly to disordered mind, and are certainly not received into an establishment like the Salpêtrière, till the case has been of some duration, and the means usually first adopted have failed.

A case of puerperal mania came under my notice, in July, 1844, of great interest. The lady's father had died maniacal, his dominant delusion being that he was, as he himself expressed it, "rotting from syphilis," though he had never contracted the disease in his life. He consulted many of our first surgeons, but nothing they could say destroyed the idea that had taken possession of his mind. The patient of whom I speak showed symptoms of this sad malady five or six days after her first confinement. All the most essential characteristics of the disease were exhibited in their turn. She had the suspicious maniacal look. She was careless about her infant; sometimes declaring it was not hers; at others thinking she had been delivered of twins. Sometimes she would not look at it when it was brought to her; but generally the sight of it somewhat excited her; though she displayed no maternal feeling towards it. Occasionally she would remain for hours in a sullen humour, lying on her back motionless, or incessantly pulling the bed-clothes to one side or the other; and often she would hold up her arms, and move her fingers exactly as though she were playing on the harp, of which instrument she had been very fond; then she would suddenly break out into a torrent of words, and continue for a long time together to utter broken and incoherent sentences; or repeat questions instead of answering them; or she would sing or scream loudly without any apparent cause. She seemed herself aware that her mind was affected, for she often called out that she was mad. She took a sufficiency of nourishment, the bowels acted regularly; and when taken out of bed and placed on the night-chair, she would void her urine, and sometimes evacuate the rectum; on no occasion did she soil the bed. She slept on an average about three hours every night, and got some snatches of repose during the day. Anodynes, even large doses of morphia, seemed to possess no influence over the nervous system. The pulse varied from 80 to 100, according as she had been calm or excited. It was only necessary to restrain her during one day, and that by two long towels, one placed across the chest, and fastened to the bedstead, and the other over her thighs just above the knees in the same manner. I had desired a strait waistcoat might be kept in readiness; but although it was procured, the family had a great aversion to its being applied. Both I and her general attendant, who had for nearly twenty years medically superintended a very large establishment for the reception of lunatics in the neighbourhood of London, gave it as our opinion, that her life was in no immediate danger. Things went on in this way for six days from the date of my first visit, when I was summoned hastily, late in the evening; and found, that after a tranquil night and day, which gave her friends reason to believe her much better, she had become comatose. Her pulse was at 160; her feet and legs were cold: her head hotter than it had previously been; and she was bathed in a profuse perspiration, which had continued for eight or ten hours. The pupils were contracted to a point, and the eyes suffused. Notwithstanding her apparently insensible state, she swallowed fluid by two or three tea-spoonsful at a time. She continued to sink, and died in the course of the night. Much to my disappointment, a *post mortem* examination was not allowed; but I have little doubt that rapid serous effusion had taken place. I never saw an instance of puerperal mania which carried with it so good a lesson, in respect to prognosis. Both the general attendant, accustomed as he was for many years to the study and practical superintendence of cases of this kind, in one of the largest establishments near London, and myself, augured well as to the eventual result; and expressed a generally favourable, though certainly a guarded opinion; yet within a few hours of his and distrust, is the most difficult variety to cure; while if the aberration is of a happy turn, and the patient is rather sportful than gloomy, the chances of a speedy recovery are greater.

Treatment.—I regret I have but little satisfactory to offer, with regard to the treatment either of mania or melancholia. The general method of management, however, applies equally whether the disorder appears during pregnancy, or supervenes after the completion of labour. It appears to me that our principal duty consists in combating the morbid symptoms as they arise, allaying the nervous excitement, and husbanding the patient's strength; and our system will combine both a moral and a medical plan of treatment. From the violence of the symptoms sometimes present under mania, we might be inclined to bleed largely from the arm; for, as Burrows most judiciously remarks, the symptoms of excitation may easily be mistaken for inflammation, and muscular exertion for vital power.* Such practice, however, has been found highly prejudicial; it does not cut short the disease, and only quiets the patient for the time the faintness continues. It tends, indeed, to weaken the system, and render the recovery protracted, if not to depress the powers at once, beyond the possibility of restoration. Occasionally, in very plethoric habits, the employment of the lancet may be admissible, but it is certainly not so in the generality of cases; and, as a principle, should only be had recourse to in disorders of the mind, when there are other symptoms present which would lead us to abstract blood if the mental faculties were entire.† Leeches to the temples, however, the cupping-glasses to the back of the neck—blisters to the forehead, between the shoulders, or behind the ears—are almost always useful when there is much force in the circulation; and taking off the hair, either partially or entirely in all cases, with the occasional application of cold to the head, if there be preternatural heat of the surface, will be found beneficial.‡ Setons and issues to the neck, on the scalp, or some other part of the body, have been thought advisable. Denman,§ with regard to these

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last seeing her, she was prostrated suddenly in the way I have described: and all hope of her recovery as suddenly vanished. He was as much surprised as I was at the rapid change that had taken place.

* See Burrows, Comment. pp. 399 and 403; and Gooch, pp. 162 and 163.

† "Pain of the head, with fever, is a much better indication for blood-letting, than disorder of the mind, without these symptoms."—Gooch, Op. cit. p. 163.

‡ Burrows (p. 402) prefers cupping on the shaven occiput, vertex, temples, or behind the ears, to leeching; and thinks (p. 406) that blisters to the head or its neighbourhood do harm; but that, when coma or torpidity of the system is present, either blisters to the thighs or legs, or sinapisms to the feet, are serviceable. If, however, the latter are kept in contact with the skin after the patient has shown expressions of pain, he has seen them prejudicial by converting ordinary delirium into perfect fury. My own experience would teach me that *in the early stages of the complaint*, blisters applied near to the seat of the disease are decidedly useful.

§ On Mania Lactea, 1810, p. 62.

counter-irritants, observes, that he has often wished to try them, but has been deterred either by the restless and turbulent state of the patient, or by her general health. Purging is of essential service; not, indeed, carried to the extent of inducing a number of watery stools, but merely with the view of fully clearing the bowels; and for this object the warmer purgatives will be found to answer better than any of the neutral salts. Many cases have occurred where the disease has almost instantaneously given way to the thorough evacuation of the canal.* In such, the matters expelled have been in excessive quantity, most unhealthy and offensive, and were evidently the exciting causes of the derangement. The exhibition of emetics has been attended with such signal advantage, that these medicines have been regarded by intelligent physicians as more efficacious than cathartics;† but whenever there is much depression, with a cold skin, pallid face, and a feeble and rapid pulse, nauseating remedies (especially antimonials), by adding to the weakness, are likely to prove injurious if repeated. Of all internal medicines, narcotics are the most valuable, after the bowels have been freely opened; they are, indeed, more serviceable than in ordinary mania, because the puerperal variety is more uniformly dependent on accidental nervous excitement, irritability, or depression; for this peculiar malady much more frequently arises from disordered function than organic disease. If opium can be borne, it may be exhibited in any of its forms; and if it produces quiet, may be repeated at intervals: should its action, however, be unfavourable, full doses of hyoscyamus, combined with camphor, may be found an efficacious substitute. So long, indeed, as there exists a heated and flushed cheek, with much thirst, this class of medicines should be withheld; but when any febrile paroxysm that may have arisen has been moderated by aperients and salines, they may be most usefully exhibited. To obtain the full benefit from sedatives, however, they must be given in large doses; or a full dose may be taken at first, and smaller repeated at short intervals, until the system is brought under their influence. It is well known to what an extent the constitutions of persons labouring under ordinary mania resist the action of opiate, as well as all other remedies; and, although in a modified degree, the same remark applies to the puerperal form. In my own practice the exhibition of morphia has been attended with the happiest results. I am generally in the habit of ordering a grain or a grain and a half to be given for the first dose, and a quarter or third of a grain to be continued at intervals of two or three hours, until some effect is distinctly perceptible from its use; and I have seen some instances in which this plan has seemed to crush the disease at once; when the patient, highly excited, or obstinately sullen before, after having taken two or three doses has fallen into a quiet slumber, and awoke after the lapse of a few hours with her mind perfectly restored. I grant that cases are occasionally met with in which any preparations of opium, even morphia itself, as well as other narcotics, fail to soothe; and I quite agree with Denman,* that when this occurs, such drugs "wonderfully increase the turbulence, and often produce very alarming symptoms." But this is no reason for discarding them without a trial; it is only an additional reason why we should watch their action narrowly; and suspend them, if we find their influence prejudicial. A case quite in point is recorded by Mr. Jeffery, of Sidmouth;† the attack came on five days before delivery, and on the seventh day of the disease, Mr. Jeffery remarks, "Narcotics appearing to do more harm than good, it occurred to me that the hydrocyanic acid,—as a medicine which might be called purely sedative,—might be the best adapted to her case." He accordingly exhibited five minims of the diluted acid every four hours, with the most marked benefit; her attendants, indeed, observed that the patient became more tranquil soon after taking the first dose; and that she seemed decidedly better after each repetition; after twelve doses she was so much improved that it was thought unnecessary to proceed with it farther. I think this medicine, under such circumstances, is well worthy the attention of the profession.

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* Gooch, Op. cit. p. 157, gives a most striking case illustrative of this remark.

† Gooch, p. 163.

Many years ago, Dr. Kinneir‡ strongly insisted on the value of large doses of camphor in this disease: but the eulogium he passed upon that drug has not been corroborated by his successors. Gooch,§ however, recommends it in five-grain doses with a like quantity of extract of henbane: recommending at the same time that the night dose should be doubled; and Campbell ‖ thinks, if administered at all, a scruple should be given every third hour; but he evidently does not think highly of its efficacy. Burrows ¶ has never seen any benefit from it in the early stages; and this remark quite accords with my own experience. One principal object in the management of these cases is to procure sleep; and that should be attempted by every means within our power.

When the disease has become more chronic, attended with great debility, the diffusive stimulants (particularly ammonia) are indicated; and much service has been obtained from the liberal use of the mineral acids, combined with bark or other tonics, in keeping up the strength, and supporting the digestive powers. In few cases of puerperal mania will the patient bear a restriction to very low diet; and in the melancholy form, one of a nutritious, cordial, or even stimulating kind, is called for. Under such circumstances, wine, or brandy, may be added to the ordinary articles of food. Unless there be other contra-indicating symptoms, that state of the mind will offer no objection to, but rather an argument in favour of, such kind of nourishment being afforded. Sometimes we observe that the patient will take whatever is offered her, although she signifies no desire for food; at others, she will obstinately refuse to let a particle of anything pass her lips; and this is an additional reason why she should not generally be kept low.* From the apathy usually manifested about nourishment, a careless nurse will often allow many hours, or even days, to pass over in succession, without offering anything beyond a little tea or gruel; from which the most injurious consequences have resulted. It becomes our duty, then, to assure ourselves that a certain quantity of food, either fluid or solid, is taken within each twenty-four hours, and to insist on its being given with the regularity of medicine.

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* Page 55 of the pamphlet already noticed.

† London Med Gaz. April 20th, 1839.

‡ Denman on Mania Lactea, p. 57.

§ Page 166. ‖ Mid. p. 381. ¶ Page 406.

Another point worthy our grave consideration, is the propriety of seclusion and restraint, and the general moral management. It is scarcely necessary that I should insist on the patient's never being left a moment alone in any of the forms of mental aberration, nor in the removal from her reach of whatever can be converted into instruments of self-injury; such as knives, cords, garters, or any articles of dress by which strangulation could possibly be effected. The door should be kept locked, and the windows tightly nailed down, or so secured as to be only capable of being opened to the extent of admitting the requisite quantity of fresh air. If the case is likely to be of long standing, her nurse and other domestic servants should be removed; two females accustomed to the charge of insane patients must be substituted; and they should take their rest alternately. Such persons have both a better physical method of managing the insane, and also possess from habit more moral control over them than ordinary nurses. Another reason for this arrangement is, that it is highly desirable to remove from her sight, as far as is practicable, every object with which her mind is familiarly associated, which may tend to excite efforts of memory, or call up trains of ideas that will only lead to greater bewilderment. For the same reason, interviews with the husband and friends should be forbidden, or only allowed rarely, and for a few minutes at a time. Experience has fully proved that indulging the importunities of relatives on this point has been decidedly injurious.* Such interviews are generally productive, on the patient's part at least, of increased agitation and altercation; they exasperate rather than soothe, especially if, as is very commonly the case, she have taken up the notion that her friends are conspiring to do her injury. The evil tendency of such experiments must be forcibly and honestly pointed out; and the good sense and feeling of the parties should be appealed to for the purpose of persuading them to forego their own anxious wishes. For the same reason, as well as its own safety, the child should be taken away; and unless she has expressed great anxiety to see it, (which, however, is seldom the case,) it should never be brought within her sight.† Even if we think it right to grant this request, she should not be allowed to take it in her arms, lest, with the cunning proper to mania, she should suddenly inflict on it irreparable mischief.

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* I attended the mother of a large family who had become maniacal during the latter months of pregnancy. I was in hopes she would regain her reason after her delivery; in this, however, I was disappointed: the disease became even aggravated; and when the changes connected with the puerperal state were so far advanced that her removal became safe, she was placed in an establishment entirely devoted to the care of insane persons. After having remained there for some weeks, without any mitigation of the symptoms, on a sudden she obstinately persisted in a refusal to take nourishment. I was informed, that for a whole fortnight, neither by force nor entreaty, could anything be got into the stomach; after which time she died, literally starved.

If she be very unruly and boisterous, it will be necessary to confine her in a strait waistcoat. Such a means of restraint is both more efficacious and less exciting that the use of bodily power, which always leads to violence and struggles. In every case, however quiet the patient may ordinarily be, it is proper that a waistcoat should be constantly at hand. The very mention of the means about to be used will often lull into a temporary repose the most turbulent maniac.

Lastly, we will consider the propriety of removing the patient entirely from home. There is no question that, if circumstances permit, much benefit is often derived from the change to another residence, particularly from a confined to a purer air, and from a noisy into a quiet situation. I should, however, highly object to her being placed among permanent maniacs, because of the great hope we entertain of a restoration, the uncertainty how long the affection may continue, and the chance of her recovery being sudden. In such case a shock might be produced, the effects of which it would be difficult to overcome. It would be better for her to have a whole, or part of a house, entirely devoted to her use; or if that be impracticable, she might be received into one of the smaller establishments which are to be found in all parts of the kingdom, and which are now universally conducted upon liberal and humane principles. Many cases have occurred in which too early a return home has excited a fresh outbreak; and some others where the symptoms, having undergone no abatement for a protracted period, have suddenly given way on the introduction of the husband, or some friend whom she has expressed a strong desire to see; their appearance has put an end to illusions under which she has been labouring, and dispelled the cloud that had overshadowed her mind.* Of course the medical attendant engaged in any individual case can alone be capable of judging of the expediency of such an experiment.

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* Gooch, p. 159.

† Burrows (p. 404) thinks that putting the child to the breast when the mother evinces an apathy towards it, often revives the maternal feeling, provided she will permit it; but my own observation does not bear out this opinion.

It is always desirable that employment should make a part of our moral system; and in this respect the previous habits and tastes should be studied. If, then, she can be persuaded to amuse herself in any way to which she has been accustomed, or for which she has a natural fondness, such as drawing, music, or even writing, a quicker progress towards restoration will be made. But, as is judiciously observed by Denman, in the pamphlet I have already alluded to, it is not "advisable to hurry the patient with a view of shortening the duration of the disorder, but to lead the mind to its own course of operation; for then there will be less likelihood of a relapse." Out-of-door occupation, however, when she can be trusted abroad, is far preferable; and gardening is perhaps as simple, interesting, and little exciting as any that can be chosen.† When a favourable alteration has occurred, travelling through a strange country will probably tend to dissipate the gloom of mind, and to hasten recovery.

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* See a case by Gooch, p. 169.

Burrows (p. 407) gives a rule on this part of the treatment, well worth being borne in mind. "The circumstance which should govern it (*i.e.* seclusion) is the existence of, or freedom from, any morbid association of ideas with home, or perversion of affections, suspicion, &c. If the affections are natural, and it does not revive illusions, or irritate, some domestic intercourse may be allowed; but those only should have that permission against whom no prejudice exists."

† I insert the following from Denman's pamphlet, 1810; because that is not so well known as it deserves to be, and because the story itself is curious;—"When the House of Commons was engaged in framing the act for the regulation of madhouses, among other sources of information, they had reports from different counties. In that sent from the county of Norfolk it is stated to have been the usual practice to lodge the insane poor with the lower class of farmers, who employed them constantly in the most laborious parts of their business. What strict caution or treatment might be required before they could be brought to submit to these occupations, does not appear; but it has been said, that a greater number of those who were thus treated recovered, than under any other management." This seems, then, to have been the first practical experiment made in this country of the system of unexciting employment, now so generally adopted for the recovery of this unfortunate class of our fellow-beings.

PUERPERAL FEVER.

In the whole range of scientific medicine there is no subject which is in my opinion more difficult to treat, than that of *puerperal fever*. And this not only on account of the intrinsic perplexity in which it is involved; but also in consequence of the contradictory opinions put forward by men of the first eminence in the profession, regarding its nature and mode of treatment. Some have considered it a specific disease, belonging exclusively to the puerperal state; others have looked upon it as an ordinary complaint, modified only by the peculiar condition of the system under child-bed. Some are strenuous in the opinion of its being highly inflammatory; others think it an asthenic fever. Some, again, suppose it in an eminent degree contagious; others, that it is incapable of being communicated by any means; but all agree—for on this point there cannot possibly exist two opinions—in its dangerous character, and in the little control that the boasted power of medicine possesses over it.[*] It is impossible for me here to give an analysis, even in the most summary manner, of the sentiments of the numerous respectable writers on this dreadful scourge; but I shall content myself with offering to the notice of my younger brethren my own views, founded partly on the testimony of others, and partly derived from personal observation.

The discrepancy that is so singularly apparent in the works of different authors regarding the nature, history, symptoms, and treatment of puerperal fever, may be easily reconciled without supposing any of them guilty either of carelessness or misrepresentation. They have each faithfully recorded, no doubt, the phenomena they themselves observed. and as faithfully handed down the effects of the remedies employed; but the histories themselves carry with them internal evidence that the diseases described have differed widely from each other in their very essence; though all have borne the title "Puerperal Fever." I cannot help thinking, indeed—and I trust I may not be deemed presumptuous in stating so much—that the student is liable to be deceived, if he grounds his ideas of this malady solely on the observations of one or two writers, especially those who have witnessed epidemics, as they have appeared in hospital practice, however graphic the representation may be; because scarcely any two have exactly resembled each other; and because the symptoms in all cases are much modified by the temperature and other qualities of the atmosphere, the season of the year, the localities in which the disease appears, and several external circumstances, independently of the constitution of the patient herself. To take, therefore, any one set of cases as a type of the whole, would lead, in my mind, to most erroneous inferences; and, although I acknowledge with great pleasure, that much information of the most valuable kind is to be culled from the different monographs that we possess upon the subject, still it requires that they should be all studied together, and analysed and sifted thoroughly, before a correct notion can be formed by the young practitioner of the general character that puerperal fever, as it is seen in more ordinary practice, assumes.

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[*] Armstrong lost 4 cases in 44; Campbell 22 in 79; Gordon 28 in 77; Leake 13 in 19; Ferguson 68 in 204; in the General Lying-in Hospital, however, in 1834, 5 died out of 9; and in 1838, 20 out of 26. The last-named physician thinks that in an epidemic season to save two out of three may be considered good practice. Dr. F. Bartsch, at Vienna, records 109 deaths out of 175 patients attacked by the disease. Dr. William Hunter saved only one out of 31. In his lectures he used to aver, that even in private practice 3 out of 4 would die. (Gooch on Peritoneal Fevers, p. 9.) Ingleby says, in the Birmingham Infirmary, about the year 1826, 16 or 18 cases occurred, with not a single recovery. I have not myself kept any record of cases of this kind; but certainly in my practice, even in the most epidemic seasons, the proportion of deaths has not been so great as in most of the averages detailed above.

My own opinions are not grounded upon any single series of cases; though I have watched carefully the progress of the malady every year when it has shown itself epidemically in the eastern districts of London, since I have been in practice, as well as in isolated instances; but they are deduced, through the experience of a number of years, from cases occurring under many varieties of circumstances, and in all ranks of society, from the most distressed pauper to persons in comfort and affluence.*

It appears to me, then, that the vague and undefined term *puerperal fever* has been applied to at least four very different diseases incidental to child-bed; and that to this circumstance may mainly be attributed the confusion which has arisen in its description, and the contradictory evidence that has been from time to time brought before the notice of the profession, as to the efficacy of particular remedies. The phrase, indeed, is used in far too general a sense, and affords us no positive indication of the disease meant to be described; and it is the uncertainty which attaches to this want of specific application of the term that has made me much averse from its employment. Not only have difficulties arisen in description, consequent on this system of generalising; but the most fatal mistakes have, I fear, been committed in practice, by those who have shaped their treatment according to the doctrines of others, without sufficiently considering the identity of the disease they have studied on paper, with that which has come under their own eye. They have, therefore, followed the instructions of some favourite author, or adopted a particular system, being satisfied that they were acting up to the most approved method of treating "puerperal fever."

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* Although I do not adopt any of the divisions of previous authors, I think it right to put my reader in possession of those chiefly followed. Thus Gardien gives us,—1, angiotenic fever purely inflammatory; 2. adenomeningic, slow fever, with cerebral disturbance; 3, meningo-gastric, with bilious derangement; 4, adynamic, with great depression; 5, ataxic, nervous; 6, fever, with local phlegmasiæ. Tonellé,—1, inflammatory; 2, adynamic; 3, ataxic. Vigarous,—1, gastro-bilious; 2, putrid-bilious; 3, pituitous; 4, combined with hysteritis; 5, sporadic. Douglas,—1, inflammatory; 2, gastro-bilious; 3, epidemic, or contagious. John Clarke,—1, inflammation of the uterus and ovaries; 2, of the peritoneum; 3, those combined with inflammatory disposition in the system generally; 4, low fever, sometimes epidemic, with abdominal tenderness. Gooch, Dugés, Boivin,—1, inflammatory; 2, typhoid. Lee,—1, inflammation of the peritoneum; 2, of the uterine appendages; 3, of the uterus itself; 4, of the veins of the uterus. Ferguson,—1, peritoneal; 2, with gastro-enteric irritation; 3, nervous; 4, complicated. Locock,—1, acute puerperal peritonitis; 2, adynamic, or malignant; 3, intestinal irritation; 4, false peritonitis; 5, milk fever. Rigby,—1, puerperal peritonitis; 2, uterine phlebitis; 3, false peritonitis; 4, gastro-bilious puerperal fever; 5, a contagious or adynamic form. Without citing any more instances, these must be sufficient to show how much the modern attempts at forming a nosological arrangement must have tended to confuse the student and render still more complicated this very intricate subject.

I have myself seen the same name given to simple hysteritis, to peritonitis, to acute tympanites, and to a fever allied to typhus; —affections which require the adoption of very different curative measures; although to each of them the term might perhaps with some propriety be applied, because in all there is present more or less of febrile action.

Of hysteritis it is unnecessary that I should say any more, since that affection has already been the subject of a former section; I shall proceed, therefore, at once to the consideration of

PERITONITIS.

This disease almost always occurs within a week after delivery; most frequently about the end of the second, or some part of the third day. It is ushered in by shivering, and is attended with acute pain over the whole or principal part of the abdomen. It may attack women of the most robust as well as the most delicate habit; it may occur equally after an easy and natural birth, as well as after a tedious or instrumental delivery. Indeed, it does not seem to depend on age, constitution, or peculiarity of labour. It sometimes attacks a large portion of the peritoneal surface simultaneously; at others, and perhaps more frequently, it commences at one small spot, and spreads all around by degrees. When its commencement is confined to one spot, it seems always to begin in that portion of the peritoneum covering the uterus itself, or some of its appendages. It is remarked, as a general principle, with regard to peritonitis, as well as all other acute diseases of the puerperal state, that the sooner after labour it appears, the more severe will the symptoms prove, and the greater is the danger of a fatal result. If it be not checked, it runs on rapidly to its termination; and after its continuance an uncertain time, the symptoms are suddenly changed from those of high excitement to those of great exhaustion and extreme debility. It is both more frequent and fatal in hospitals than in private practice—in large towns than in the open country.

Two varieties.—Puerperal peritonitis appears under two very distinct forms—the one sporadic, in which the cases are isolated, and the disease does not extend; the other epidemic or contagious; and it is principally to the latter variety that the term of puerperal fever has been applied. I have no doubt myself of the contagious nature of peritonitis in some instances; I have known it many times both spread through a particular district, and be confined to the practice of a particular person, almost every patient attended by such person under labour for some time being attacked, while the neighbouring practitioners did not meet with a single case. It seems capable of being conveyed, not only by the ordinary modes in which contagion is usually communicated, but through the dress of the attendants also: so that medical men, nurses, or even visitors, may themselves be the instruments of its fatal propagation from one puerperal woman to others, while their own health is not in the least degree disturbed.

Although these two varieties are described as *distinct diseases* by Burns* and some other writers; and are considered as *separate forms*† by most; still it appears to me more convenient to treat of them both together; because the same symptoms belong to both; because they both run the same destructive course, if not checked; because the same morbid appearances, as far as regards the pelvic and abdominal cavities, are observed in both after death;‡ and because I believe, if they can be cured at all, the same remedial measures are applicable to both.§ It must be borne in mind, however, that the variety to which contagion is superadded is by far the more violent, rapid, and dangerous of the two. It approaches in severity closely to yellow fever,—the typhus of the tropics; and, when it terminates in death, is more quickly fatal than any disease we know in this climate, except that with which we have unfortunately become acquainted of late,—the Asiatic cholera. Unless means are taken to check it within the first ten or twelve hours, in the generality of cases, our best exertions will be made in vain. When it appears as an epidemic, like all other disorders of that class, it is always most severe in each individual instance, when most prevalent; the cases are also more mild at the commencement and towards the termination of the epidemic, and more fatal when it is at its height.

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* Midwifery, Edit. 5, p. 533.

† See Abercrombie, Pathol. and Pract. Researches, p. 189, &c.

‡ See Rigby's System of Mid. Library of Med., vol. vi. pp. 274 and 290; where he describes the appearances in the abdomen after death, *as exactly the same* in the two varieties, and indeed almost in the same manner; although at p. 290, when speaking of the *contagious* form, he says, "the lesions observed after death differ considerably from those of acute peritonitis."

§ See Hey's Treatise on Puerperal Fever, 1815, p. 121.

Sometimes the attack at the very onset is extremely acute; at others it is more insidious. In the latter instance, it is very likely to be overlooked, and may run on to a considerable extent before the disease is so well marked as to induce the physician to apply the proper remedies.

A question has arisen, and been the subject of much dispute, whether the inflammation which constitutes puerperal peritonitis is of the ordinary kind, or specific and peculiar. Some have supposed that it is nothing more than violent common inflammation;[*] others, that it is allied to hospital gangrene;[†] and others, that it is of an erysipelatous character.[‡] The sporadic variety, indeed, appears to possess no characteristics which could separate it from acute peritonitis occurring in other states of the system; but numerous facts have been published which would lead to the belief that the epidemic form partakes largely of the nature of erysipelas; and I am inclined to this opinion myself. The cases, indeed, recorded by Ingleby,[§] Ceely,[||] and Sidey,[¶] are so strongly in point, that it is almost impossible to withhold the conviction that there is a form of fever to which puerperal women are liable, not only arising from the contagion of erysipelas, but in its turn also occasioning that disease in other persons. Whether in this affection, when it arises under such circumstances, the peritoneum is always attacked, is a question which I cannot answer; but I believe it to be so in the great majority of cases.[**]

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[*] Mackintosh on Puerperal Fever, 1822. Campbell on Puerperal Fever, 1822; see also his System of Mid. p. 359.

[†] Cruvelhier. Ferguson, see p. 104 of his treatise.

[‡] Gordon, Louder, Hull on Phlegmasia Dolens, p. 246. Lee, Med. Gazette, Aug. 25, 1843, and many others.

[§] Edinb. Med. Journal, vol. xlix. p. 412.

[||] Lancet, March 7, 1835.

[¶] Edinb. Med. Surg. Journal, January, 1839, p. 91. This is far from being a new idea, for Plouteau, in 1750, called the disease epidemic erysipelas of the peritoneum; and Gordon, writing in 1795, says he has unquestionable proof that there is an analogy between erysipelas and puerperal fever.

[**] Rigby (Mid. p. 392) states that in one epidemic at the General Lying-in Hospital, the child of every woman who died of the disease, perished of erysipelas, which ran its course in a few hours; and I am acquainted with two instances of a like nature, that occurred in the practice of one gentleman in the same month. Meigs (Woman and her Diseases, p. 592) tells us that out of 95 patients who became the subjects of puerperal fever attended by Dr. Rutter, of Philadelphia, 15 of their children died of erysipelas, which commenced at the umbilicus. Gordon, Hey, Clarke, Armstrong, and many others, have remarked the prevalence of erysipelas, as well as malignant typhus, when the puerperal fever was epidemic. On three occasions I have known the women who nursed patients that died of this fever, become the subjects of erysi-

Causes.—The causes which principally predispose to puerperal peritonitis are precisely such as lead to unhealthy action in general: a depressed, anxious, and desponding state of mind,* intemperate habits, or deficiency of food, and perhaps previous disease existing in the system; but it must be confessed that in very many, if not by far the greater number of instances, no predisposing cause can be traced. The immediate and exciting causes, as they have been noted, are so various and numerous, that it is impossible to recount them all; and I shall therefore confine my observations to those which have received the greatest share of attention from the profession. Among the latter, the peculiar constitution of the atmosphere takes a very prominent place; it would seem from the tables published by Ferguson, that wet and cold weather is particularly favourable for its propagation. And it is remarkable that in those seasons when the malady has been epidemic in this island, it was also prevalent in different parts of the European continent.† Armstrong attributes the epidemic at Sunderland to the noxious state of the atmosphere; and Leake remarks that the disease "will always be found most fatal when most epidemical, that is, during a distemperature of the air."

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pelas of the leg. A striking instance of the analogy between these two disorders I saw in the autumn of 1841. Erysipelas was then very prevalent at Rotherhithe: a medical friend of mine had six cases within a very few days of each other; while closely watching these patients he attended a lady in labour, in the vicinity of two of them. Puerperal fever speedily showed itself. I saw the patient, and she rapidly died. Her nurse was seized with erysipelas of the hand, and placed herself under the care of another gentleman. One day, after having made an incision and dressed the wound, this second gentleman was called to a case of midwifery; the same kind of fever supervened, and this also terminated very rapidly; I was summoned to the patient late at night, and when I arrived she was just dead. A third fatal case attended by the same practitioner I also saw, and others that did well. My friends both of them for some time after, I believe, declined taking charge of women in labour; and the disease disappeared. Subsequently to these dates, a medical friend called on me one evening in much distress, wishing me to see two patients with him suffering under "puerperal fever." He said he had just lost two others, of most acute and rapid attacks, and feared these two would die also, since the symptoms in them all appeared exactly similar. Observing his arm in a sling, I enquired the cause, when he told me he had been laid by with an abscess in the fore-arm, consequent on a puncture he received in making a *post mortem* examination some weeks before; and that he had only recently resumed his professional duties. I immediately asked him whether he did not imagine the illness he had gone through had something to do with the development of the disease in his puerperal patients. Such an idea had not crossed his mind; however, on my recommendation, he discontinued attending cases of labour for some time; and he saw no more of "puerperal fever." I must add that there were no other cases at that period in the neighbourhood of his residence, and that one of the patients I saw with him lived out of London.

* "During the periods of the epidemic prevalence of this disease we find that the delicate, the forsaken, the unmarried, and the unhappy, were most liable to be attacked, as well as the most liable to be destroyed." (Moore on Puerperal Fever, p. 189.) Campbell (Treatise, p. 210) says, that "of eight unmarried women who became ill with the disease, only two survived." Gooch (p. 60) says, "It is an old remark of those who have had much experience in lying-in hospitals, that the single women are peculiarly liable to fatal disease after delivery."

† Ferguson, p. 102.

commences in the blood. Locock* and Ingleby,† on the contrary, regard the primary impression as made upon the nervous system. Whichever of the two large systems,—the vascular or nervous, is primarily affected;—whether it be the immediate absorption of morbid matter into the blood, or a blow first sustained by the sentient organs, that gives rise to the phenomena of "puerperal fever," it seems indisputable that the disease, in its epidemic or contagious form, at least, is generated by the introduction of a subtle and virulent poison into the body, by which the vital fluid is vitiated, and from which the malady derives its extraordinary malignancy.

Symptoms.—The most striking feature of this disease consists in excessive tenderness over the whole or a large portion of the abdominal region, attended by pyrexia in a greater or less degree. It is usually ushered in by a rigor, either partial or general, to which inflammatory fever succeeds. The patient may perhaps have been in an unsatisfactory state from the period of her delivery; or, what is more common, she may have appeared very well for twenty-four or forty-eight hours, when she is suddenly seized with shivering, more or less severe. Sometimes, indeed, the rigor is so intense as to agitate the whole person, and even shake the bed on which she lies; at others it amounts merely to the slightest sensation of chilliness, confined, perhaps, to the back. Often, even this degree will not be acknowledged; and unless we are particular and precise in our inquiries, we may be impressed with the idea that not the slightest chill has been experienced. We find, in most cases, that the more intense has been the cold sensation, the more violent will be the after-symptoms. Morbid heat and dryness of skin succeed to the chilliness, attended by great acceleration of the pulse, which is also usually feeble; hurried respiration; nausea or vomiting; more or less pain in the fore part of the head; and exquisite tenderness of a portion or the whole of the abdomen. With this there is great pain in the loins, reaching sometimes along the sacrum even to the coccyx itself. In many instances we may remark an unnaturally rapid pulse before any chill has been felt. This would lead us to watch the pulse closely, for the first few days after labour; and it is a good rule in all cases to consider that some unhealthy action is going on, if it remains constantly above 100 beats in the minute. Especially must we be on our guard for the outbreak of serious disease, should at the same time any epidemic fever be prevalent. If the abdominal pain be limited in extent, the hypogastric region will be the part generally affected. A short, quick, hacking cough, is often present. Sometimes, indeed,

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* Library of Medicine, vol. i. p. 352.

† Edinb. Med. and Surg. Journal, vol. xlix. p. 423.

Local causes, generating malaria, also have great influence in promoting it; and Locock,* Ferguson,† and Rigby,‡ agree in considering that the unhealthiness of the Westminster Lying-in Hospital during some years may be accounted for by its situation being low, and a large, uninclosed sewer having run, or rather stagnated, in its immediate neighbourhood.

Independently of an epidemical constitution of the air, I have no doubt whatever that the disease under consideration may be communicated by contagion, of which fact many melancholy instances have come under my own eye. Indeed, this is now so generally conceded by the profession, that to quote examples in confirmation would be superfluous.§

The immediate causes are still more obscure than either the predisposing or exciting; and in the same proportion they have been multiplied. Ritgen considers it dependent on a metastasis, not of the milk, but of the blood destined to form that secretion, from the breasts to the peritoneum, and this, indeed, embodies the doctrines of the German schools. Kirkland, in 1774, contended that it might be produced by the absorption of putrid matters lodging in the uterus. Legallois thinks it arises solely from the absorption of pus from the uterine surface; and Cruveilhier, who likens the internal face of the uterus after delivery to a stump after amputation, considers that it is originated by the absorption of pus and putrid fluids, through the uterine veins into the system in general. In this he is followed by Ferguson, who, by arguments drawn up and set forth with much ingenuity, has laboured to prove that the phenomena of puerperal fever originate in a vitiation of the fluids; that the causes which are capable of vitiating the fluids are particularly rife after child-birth; and that the various forms of puerperal fever depend on this one cause, and may be readily deduced from it. Rigby‖ also considers that the affection throughout the whole attack the skin is moist, either universally or in patches; and towards the close of the complaint, when it terminates fatally, it often becomes soft, relaxed, and clammy, and, as observed by Armstrong, the hand glides smoothly over it, as if it were wet with soap and water.

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* Library of Med. vol. i. p. 358.

† Essays on Diseases of Women, part i. p. 293.

‡ Library of Med. vol. vi. p. 104.

§ This position, however, has been denied by some men both scientific and practical; among whom I may mention Hulme, Tonellé, Dugès, John Clarke, Hey, Armstrong, Mackintosh, Campbell, and Lee, the two latter of whom speak doubtfully; but consider that after examining the body of a woman who has died of this disease, the infection may be carried by the surgeon to a puerperal patient. On the contrary, Meigs (Treatise on Obstetrics, p. 631) "utterly rejects and denies the doctrine of contagion," or the possibility of carrying infection to a puerperal patient, after having inspected the body of another, who had perished under that malady. But as this physician also *wholly rejects the doctrine of contagion in measles, scarlet fever, and pertussis*, we can scarcely fail to believe that his opinions regarding the non-communicability of disease in any of its forms, are too deeply planted to be rooted out by any facts, or arguments, which it is in the power either of Nature or Philosophy to supply.

‖ Review of Moore's Treatise, British and Foreign Med. Rev. No. iv. p. 481. See also Library of Med. vol. vi. p. 287.

The shivering is quickly followed by oppression at the præcordia; and early in the disease the countenance undergoes a marked change; sometimes it is suffused; more frequently sallow; dejected, ghastly, and indicative of alarm or despondency. So great and sudden is the alteration, that the most superficial observer cannot fail to notice it. The eye becomes sunken, glassy, languid, and inexpressive; and a dusky lividity may be remarked beneath the lower lid, along the ridge of the orbit. The urine is generally defective, high-coloured, turbid, and passed with difficulty or pain. The lochial discharge is often wholly suppressed; at other times its quantity is diminished, and it is fœtid to the smell; occasionally, but very rarely, it continues to flow naturally. The breasts soon become flaccid in the majority of cases; but I have known the milk continue to be formed, even abundantly, till within a few hours previous to dissolution. The hands and feet are often cold from the very first onset of the disease. The patient sleeps at intervals; but she is disturbed by frightful dreams, and wakes frequently in terror, and with a start: and throughout the attack she watches with solicitude the face of her physician, as though to gather from its expression his opinion as to the probability of her eventual recovery.

With the increase of abdominal tenderness, the belly swells, becomes tense, and sometimes acquires a bulk as great as it possessed before the commencement of labour. The tenderness is so acute, that the gentlest pressure cannot be endured; and even the weight of the bed-clothes produces much agony. The patient lies on her back,—the only posture she can support,—with her knees drawn up, partly for the purpose of relaxing the abdominal muscles, and partly to relieve her person from the pressure of the coverings. For the same reason she uses all her efforts to prevent the free descent of the diaphragm; and the breath is therefore drawn with a succession of rapid, short, panting inspirations.

Not much reliance can be placed on the appearance of the tongue: it is sometimes completely covered with a whitish or cream-coloured slimy coat; occasionally it is thickly furred; and not unfrequently it is perfectly moist, and soft, and preternaturally red. But although the mouth be not parched, there is almost always present distressing and unquenchable thirst.

The abdominal tumefaction is dependent on two causes—the one, inflation of the intestines, which always occurs as the disease progresses; the other, effusion of fluid into the peritoneal cavity, which mostly takes place previously to death. The effusion appears to be an effort made by nature to relieve the surcharged vessels; but in itself, although designed as a method of relief, is productive of a fatal result. With the effusion of fluid there is a remission of the pain more or less sudden; but this is not attended with an amelioration of the general symptoms; on the contrary, they are then all aggravated; and a *sudden* cessation of the intense suffering hitherto felt, although always hailed by the patient and her friends as the harbinger of a favourable change, must be looked upon by the physician as the almost sure precursor of death. The pulse becomes weak, fluttering, and so rapid as scarcely to be numbered; there is more distress, and uninterrupted watchfulness; a state of muttering delirium supervenes; the tongue becomes dry and brown; the extremities perfectly cold; a circumscribed dingy crimson flush appears upon the cheek; vomiting of the same dark matter that is ejected in the last stage of typhus occurs; sometimes in enormous quantity; and it appears to be pumped up from the stomach, and to run out of the mouth almost without effort; subsultus tendinum, and picking of the bed-clothes, are observed; and the patient, as she lies upon her back, slips down from the pillow, towards the middle of the bed. When these symptoms manifest themselves, the case is to be looked upon as hopeless. It is seldom that furious delirium shows itself in any stage of this disease; not unfrequently, indeed, the intellectual faculties remain unimpaired till nearly the moment of dissolution; and we may regard delirium, or any degree of mental disturbance, almost as a mortal symptom.

Throughout the early part of the disease the bowels are obstinately costive, and powerful doses of purgatives are required to procure evacuations; but in the second stage violent diarrhœa often comes on, which it is impossible to check; and the stools are almost always voided in large quantity, and are very offensive.

Occasionally a rapid metastasis of the inflammation takes place. I have known the disease suddenly leave the peritoneum, and as suddenly attack the pleura, being translated from one serous membrane to another of the same character. I have even known it pass back from the pleura to the peritoneum; and I have met with a few instances where the membranes of the brain were affected, as the disease in the abdomen subsided.

When the disorder appears as an epidemic, though the chief symptoms are still the same, many are greatly aggravated. The pulse is much more rapid than in the sporadic variety; it frequently rises at once to 140 or 150 beats in the minute, and is at the same time very small and easily compressed; the fever assumes more of a low type even from the commencement, and runs its course with far greater rapidity; the prostration of strength is more complete; the skin is cooler, being seldom above the natural standard; the belly becomes more early swollen and tympanitic; the breath acquires a faint and earthy odour; hiccough often occurs from the irritability of the diaphragm, consequent on the distension of the stomach and intestines; abscesses form occasionally, either among the muscles of the extremities, or within or around the joints; and Lee,* Marshall Hall,† Locock,‡ Ferguson,§ and Rigby,|| mention that the eyes, particularly the left, are sometimes attacked with a rapidly destructive inflammation; but this I have myself never observed; probably because the disease is always more severe in hospital practice. The great fatality indeed which has occurred in all the lying-in hospitals, not only of this country, but on the continent, at different times, cannot fail to impress the conviction that these institutions have not been attended with that unalloyed good to the poorer classes which their benevolent founders and supporters have hoped and expected. Some years ago I was solicited to take the medical superintendence of a lying-in hospital, which it was proposed to establish in the eastern part of London. Although I might have derived no little personal advantage from the connexion, I declined the proffered honour; and gave the gentlemen who called on me such reasons for doing so, as induced them immediately to abandon the undertaking; and it has never been revived. Should such an establishment again be formed in any large town, it should consist of a number of small houses detached, or at least separated from each other; and no more than one woman should be permitted to occupy any single apartment at a time.¶

If we are to expect recovery, the pulse will gradually become less frequent and more distinct, the breathing slower, deeper, longer, more equable, and less jerking, the skin more natural to the feel, the tongue cleaner, the thirst less ardent, the bowels easily acted upon, the tympanitic distension growing less, with the pain *gradually* subsiding, the urine more abundant; the patient gets refreshing sleep, and turns from her back to her side. This change in posture is one of the best symptoms we can remark; but by an inattentive observer may easily be overlooked. It might be supposed that it was a matter of no importance whether a woman lay on her back or side, but it is quite proper that our mind should be directed to this alteration in position, if it have taken place, because it is often one of the first indications of amendment.

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* Cyclop. Pract. Med. Art. Puerp. Fever.

† Med. Chirurg. Trans. vol. xiii.

‡ Op. cit. p. 361.

§ Op. cit. p. 30.

|| Op. cit. p. 291.

¶ "Happily, this form of puerperal fever exists with such fatality in hospitals alone. I believe the single chamber of the pauper is more wholesome than the spacious ward of the hospital patient." Ferguson, Op. cit. p. 32.

Diagnosis.—Peritonitis may be distinguished from more simple inflammation of the uterus by the greater violence of the attendant symptoms, and by the pain not being so circumscribed, but extending over a much more considerable space. If, indeed, we are satisfied with placing our hand flatly upon the abdomen, about the umbilical region, and pressing steadily, we may very probably be deceived as to whether the inflammation is general or more confined, because the uterus itself will then be more or less subjected to the weight of the hand. It is better to apply one finger only to various parts of the abdominal surface; and if, on making pressure with its extremity, we find the patient shrink from the touch, whether we place it on one region or another, we may be assured,—provided the suffering be induced by inflammation,—that the vascular excitement is not merely uterine; and in proportion as the pain is diffused, will the inflammatory action have spread.

Morbid appearances.—It unfortunately happens that the opportunities of inspecting the bodies of women who have died from peritonitis, especially of the infectious variety, are by no means rare; and the appearances in different cases are very generally the same; so uniform, indeed, that we may often predict, almost to a certainty, the morbid changes we shall observe. The abdomen externally is always large, swollen, and tense. On cutting into the abdominal cavity, a large quantity of nauseously fœtid gas will escape, so as even to give the idea that the intestines have been wounded by the knife. I suspect this air is not generated during life, but the effect of putrefaction after death.* And on examining the peritoneum, we may observe it in some parts inflamed, red, with preternaturally enlarged vessels, and, perhaps, somewhat thickened; in other places it will be pale and dingy; and in others again, it will possess its natural glistening lustre. The omentum is usually more than ordinarily charged with blood, and in some cases thickened and covered with lymph. A collection of turbid serum sometimes tinged with red, more frequently resembling whey, varying much in quantity, will be found within the peritoneal sac; and floating in this fluid patches of soft lymph will be observed, which have been rubbed off from the surface of the viscera, either by the action of the parts during life, or by moving the body after death has taken place. The fluid will be found principally accumulated in the pelvis. This may, indeed, be considered accidental, and probably arising from gravitation. It is occasionally highly glutinous; but then it is remarked that very little or no lymph is present. According to Dr. Hodgkin it does not differ chemically from the serum effused in peritonitis attacking the male subject. Both the membrane lining the abdominal muscles, and that investing the intestines and other viscera, are found coated with the same kind of lymph as floats loosely in the cavity, which breaks down immediately when pressed between the fingers. Sometimes this has obtained consistence sufficient to glue the folds of the intestines more or less strongly together.* Occasionally I have remarked this deposit confined to the uterus, as though it were dingy white paint smeared over it; and whenever it is more general we find it thicker, and in larger quantity on the external surface of that viscus. On cutting through the substance of the womb, it will often be found well contracted and healthy in its parenchyma; at other times it will be softer and darker in colour than natural,—I have seen it so soft, indeed, that the finger could easily be thrust through its whole thickness;—and pus may often be observed, either in its proper veins, just beneath the peritoneum, or embedded in its structure. In some instances, on looking at the inner surface, it has appeared greenish and gangrenous in patches; but this depends on pieces of the deciduous membrane still left *in situ*, for, on its being wiped off, which can be done most easily, the parts below are found to be sound in structure, though most probably of a florid red or purple colour.

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* "The body is more rapidly decomposed after death, than from any disease with which I am acquainted." Ferguson, p. 43.

It is very seldom that, under peritonitis, the uterine appendages escape the diseased action more or less general throughout the cavity of the abdomen; they are usually involved to a great extent. They will often exhibit strong indications of morbid action, while the principal part of the peritoneum is comparatively unchanged. The ovaries, either one or both, become much more vascular in structure, and coated on their surface with a thick lamina of lymph. Not unfrequently they are reduced to a pultaceous mass, of a larger bulk than usual, and the consistence of the softest cream cheese, which most easily breaks down, and becomes almost dissolved between the fingers. Occasionally they are even converted into abscesses,—all which morbid disorganisation I have frequently witnessed;† and cases are on record where a communication has been formed, by adhesion, between the ovary containing pus and the abdominal muscles, and where the matter has been evacuated externally by ulceration, either through the parietes, or at the groin.* Under such a state of ovarian derangement, the broad ligaments and fallopian tubes are also covered with the same paint-like morbid secretion; the tubes become nearly black with turgescence, and their fimbriated extremities either of a deep crimson, or dark livid colour, and so soft as to be readily lacerated.

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* On separating the intestines from each other, I have often observed the mould of a segment of one fold attached to the surface of the contiguous one; and occasionally, especially in cases that have lasted some time, the adhesion has been so strong, that the structure of the bowel has been torn, while the adventitious adhesion has remained perfect.

† Rigby (Library of Med. vol. vi. p. 291), after describing that the ovaries become quite disorganised, says, "During the fatal epidemic which prevailed at the General Lying-in Hospital in the early part of 1838, we met with several cases where the ovaries had entirely disappeared, their site being only discoverable by an oval thickening of the broad ligament, something like an empty cyst of peritoneum.

Cases have come within my own knowledge of women who had borne a family, rapidly perhaps before, becoming barren after an acute attack of puerperal peritonitis; and such a circumstance is easily explained when we consider the extent of disorganisation that sometimes occurs under this affection, and that this change takes place in structures whose perfectly healthy condition is not essential to the continuance of life. Both ovaries indeed may be so far destroyed, as to preclude the possibility of their functions being resumed, and yet the patient may survive, and enjoy a state of good general health; or the fallopian tubes may become impervious by adhesion of their sides, or their fimbriæ may be extensively adherent to the outer surface of the ovaries, any of which conditions would necessarily render the woman hereafter incapable of conceiving. On some occasions, though rarely, the same kind of fluid as that in the peritoneal cavity, with the same flakes of soft lymph, has been found also in the bags of the pleuræ.

There are two cautions absolutely necessary to be attended to in inspecting the bodies of women who have died of peritonitis after lying-in,—the one for our own safety, the other for that of our puerperal patients. There is no question in my mind that this disease has often been propagated throughout a district, by the surgeons who have examined the corpse not having taken sufficient care to prevent its spreading through the agency of their persons; the infectious qualities—in whatever they may consist—not being lost, but being, perhaps, even aggravated after death has taken place. And it is equally well ascertained, that injuries to the fingers, received in conducting the examination of women who have fallen victims to puerperal peritonitis, are more likely to be followed by dangerous consequences than the same kind of accident inflicted under other circumstances. The knowledge of these facts would induce us to use the utmost caution, both that we might not inoculate our own system, and also that we might not be the instruments of causing a further development of such a dreadful scourge among our puerperal patients. The latter may probably be avoided by making an entire change in our dress, and attending to other precautions not necessary for me to particularise, after having attended an inspection of this sort, before we visit a puerperal, or indeed, any other kind of patient. So susceptible does the parturient woman appear to the malignant influence of morbid poisons, that I would urgently recommend my younger brethren never to leave a *post mortem* examination, from whatever cause death may have happened, especially if it should have been from erysipelas, or any puerperal malady, and proceed to a case of labour, without having first divested themselves of all articles of clothing likely to retain the principles of infection, and liberally used ablution.* I think I have traced some cases of serious illness, and even death, after delivery, to infection received from the finger *per vaginam*, when carelessness in such matters has been evinced. †

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* Lee, Cyclop. of Med. vol. ii. p. 253.

Treatment.—Both the sporadic and the epidemic varieties of peritonitis, at least as we see it unconnected with hospital practice, require, in my estimation, the same kind of management; and as this disease is in the highest degree inflammatory, a course of vigorous antiphlogistic treatment should be adopted. Our first attention, therefore, must be directed to taking blood by the lancet. If this means be neglected, no other within our power will be of the least avail; but to be productive of benefit, bleeding must be had recourse to both early and largely. If the first twenty-four hours, and often if the first twelve, be allowed to pass over without the lancet being resorted to, its aid will be applied too late; and its use will consequently be rather prejudicial than advantageous. Nor is it sufficient that the blood should be allowed to trickle down the arm slowly, and, as it were, *guttatim;* it must be abstracted in a full stream, from a free orifice, the patient being placed partly erect, so that an impression should be produced upon the system as speedily as possible. It is better that a vein should be opened in both arms at the same time, than that we should be content with letting it flow sparingly and tardily. I am myself much averse from ordering a stipulated quantity of blood to be drawn in any case where inflammatory action is present; and perhaps this objection applies with more force to puerperal peritonitis than most other inflammations. I am, therefore, not desirous of laying down any rule dependent upon quantity alone; an influence must be obtained over the system, and it matters little whether faintness be produced by a smaller or a larger loss. As a principle, however, we may say that we shall require to abstract from eighteen to twenty-four ounces, before the desirable approach to syncope is produced; and also, that the more blood the patient will bear to lose before her system begins to feel it, the greater was the necessity of the measure being resorted to. Considering the violence with which the disease makes its attack, the rapidity with which it spreads, and the immense extent of surface that lies ready to be ignited by the spark, it must be evident that a small loss will, at the best, but retard for a short time the progress of the malady;—a bleeding carried to the extent of a few ounces only can scarcely be expected to overcome it, or even to offer a decisive check to its advance.

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* Chlorine gas has the power not only of destroying the fœtor which it is so difficult to get rid of, as well after making a *post mortem* examination, as after being some time in the dissecting-room, but also of neutralising the power of any infection that may hang about the person; and therefore it would be right to use some of the chlorides on every occasion after having made a microscopic enquiry.

† In one fatal case of puerperal peritonitis to which I was called at a distance of about five miles from London, the patient's labour was so rapid that her own attendant could not be obtained. It happened that in the next house to the one she occupied a gentleman resided, who was at that time engaged as demonstrator of anatomy in one of the London Schools; the family sent hurriedly for him; he had just returned home from the dissecting-room, and very kindly gave his immediate assistance. It is impossible for any one to say that this gentleman carried unwittingly into the chamber the seeds of this dire disorder; but Murphy (Lectures on Mid. p. 588) enumerates as one of his three sources of infection "cadaveric poison;" and the histories of the epidemics at the large hospital at Vienna would lead us to believe that this is a correct assumption. In the lying-in hospital of that metropolis about two hundred and seventy-five women are delivered every month. There are three departments; the first, secret, to which no strangers are admitted; the second, in which the women are delivered by midwives only; the third, in which a midwife and a male student officiate. The midwives are not present at any of the autopsies, and they are instructed by leathern phantoms; the male students perform autopsies on the bodies of all who die, and they also perform obstetric operations on *some of these dead bodies.* The ordinary number of deaths in that division where midwives only officiate is about eight in the month, or in the proportion of one in every 34 cases; while the number of deaths in the division where the male students act in conjunction with the midwives used to be about 30 in the month, or one in every nine cases. This great discrepancy led to enquiry; and after some suggestions, which were found practically to be erroneous, Dr. Semelweiss, the assistant physician to the institution, attributed it to the male students carrying infection to the parturient women, by the direct application of poisonous matter, or indeed by inoculation. He was led to infer that the real source of the disease was to be found in the "*hands of the medical men in attendance contaminated with cadaveric poisons.*" He therefore forbad any student who had handled any dead matter, to make any vaginal examination until the following day; and he directed that every student who attended the practice of the division should wash his hands in a solution of chlorine, prior to and after every vaginal examination, made on the living subject. The result was that the *number of deaths fell at once to seven per month*, or nearly the usual average of the division attended only by the midwives; at which I believe it still remains (see Dr. Routh's account of the cause of the puerperal fever at Vienna, Med. Chirurg. Trans. vol. xxxii. p. 36). For my own part, I should look upon this improved practice as still a very large average of deaths.

It is singular to observe the contrariety of opinions expressed by practical men,—and those, too, good physicians,—respecting the efficacy of venesection in "puerperal fever;" some looking upon it as the only means of safety,* others † denouncing the lancet as an instrument bringing with it certain and speedy destruction. If we analyse the facts, however, this incongruity may, perhaps, admit of rational explanation. It is natural that those who are prejudiced against bleeding in these cases, either by instruction or early practice, should, whenever they have recourse to the lancet, use it with great caution; and the probability is, that under such a deeply rooted impression of fear, sufficient blood will not be taken to produce the necessary effect. Thus, then, may the means fall into discredit from the pusillanimity of the physician. Again, the same circumstances may induce him to delay this powerful agent until the disease has gained too great a head—until the inflammatory symptoms are subsiding, and the second stage, characterised by those of exhaustion, has supervened. Then, finding his other efforts useless, observing his patient hourly getting worse, being overruled by what he has heard and read, or, perhaps, by the arguments of another practitioner called in consultation, he commences adopting that bold practice which should have been had recourse to at the very commencement of the attack; while, at the same time, the patient being now no longer able to withstand the shock communicated, her powers immediately begin to droop, and flag, and falter. From that moment she is observed to lose ground, even more quickly, exhaustion approaches with rapid strides, and death in a very few hours terminates her sufferings. He then makes up his mind that the bleeding has destroyed her; his regret at having lent his ear to the suggestion on which he has acted is proportionably poignant, and his prejudices against the lancet are even more deeply rooted than before. May there not exist still another cause for the disrepute which most unjustly attaches to the lancet under this species of inflammation? I have already mentioned a disease which, in the absence of a better term, I have called acute tympanites, and which we shall afterwards find, although bearing a very close resemblance to peritonitis in most of its symptoms, differs from it materially in character; since there is present little or no inflammatory disposition. I said that I have myself seen this affection called puerperal fever, and I have known it proposed to be treated upon the rigid system just now recommended. As I believe such measures are not called for under tympanites, cannot be borne, and would only hasten the destruction of the patient if enforced, it is not impossible that in other instances of the same kind, venesection may have been had recourse to, and disappointing the expectations founded on its supposed efficacy,

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* Gordon, Armstrong, Hey, Mackintosh, Campbell, Lee, and most others.

† Hamilton (MS. Lectures), John Clarke (Practical Essays, p. 144), who are entirely opposed to it under any circumstances. Butter (on Puerperal Fevers, p. 26), who recommends not more that three ounces to be drawn at a time, and that *only when inflammatory symptoms are present.* Hulme (on Puerperal Fever, p. 73) thinks it improper, unless there be "violent stitches in the sides, or over the pit of the stomach;" and the first quantity should rarely exceed eight ounces. Collins (p. 393), though he recommends three or four dozen leeches. Ferguson

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(p. 152) says, that of all means bleeding is most extensively applicable; but that within the last twelve years, before his essay was published, in 1839, *large* bleedings had not been borne. This latter observation may be true in regard to the epidemics of hospitals; but it does not coincide with my experience.

may have determined the practitioner not again to trust to its employment in any case bearing the character of "puerperal fever."

After bleeding, our next object should be to purge the patient freely; and on this point, again, there has been no little difference of opinion. Some practitioners think that cathartics, in proportion as they excite the peristaltic action of the intestines, add to the distress and danger, by causing the inflamed surfaces to rub against each other with more rapidity and violence. But, in my estimation, the advantage of brisk purging is two-fold; it unloads the bowels, often considerably distended with feculent matter, and relieves the inflamed vessels by establishing a copious drain by means of secretion from their immediate neighbourhood. It is reasonable to suppose that the vessels of the serous membrane covering the intestines will be much relieved by exciting an increased action in those of the mucous surface lining the same tube; and independently of the good ordinarily derived from purging under fevers, in this particular case we at the same time obtain somewhat the advantage of a local counter-irritant. Ten or twelve grains, then, of calomel* may be exhibited soon after the bleeding, and a dose of infusion of senna and jalap may be given every three or four hours, until stools are procured. It may happen, however, that the senna draught is rejected almost immediately it is swallowed; if such be the case, we must exhibit an enema; and we may give as a purgative, a drop of croton oil, or any other medicine in which a powerful dose is contained within a small compass.

Should the disease be only suspended for a time, and should it return with violence in a few hours, we may venture to abstract a second, or in some rare cases even a third, quantity of blood. But in no case should the lancet be used a second time, until after the purgatives have acted. If the symptoms are so much mitigated as not to require resort to the lancet a second time, and yet sufficiently severe to indicate that inflammatory action is still going on in a subdued degree, eighteen or twenty-four leeches or more may be applied over the abdomen, and the bleeding encouraged by fomentations and a warm poultice. It is seldom that the weight of the poultice is much complained of, and it seems of service, not only by favouring the loss of blood from the leech-bites, but also by its own peculiar soothing influence. Gooch, Locock, Ferguson, and Rigby, all prefer, and I think with justice, a well-made linseed-meal poultice as a constant application over the abdomen, to fomentations, which cannot be changed without exposing the patient to a chance of being chilled. I am persuaded I have seen advantage from such a poultice, especially when sprinkled over the surface with oil of turpentine. In determining whether it be right to repeat venesection, we may, in some measure, be guided by the manner in which the patient has borne the loss of what was previously taken. If the abstraction of a large quantity has been required to produce faintness, she will generally be able to sustain another bleeding, and that with advantage; but, on the contrary, if syncope supervened when only a few ounces had flowed away, that circumstance is almost a sure indication of the impropriety of the operation being repeated. I have often heard a second bleeding objected to, on the ground that the patient had lost so much before; this, when the pulse still keeps up and the abdominal pain is not removed, so far from being an objection, is the best indication we can have of the necessity of a repetition; and our practice may be bold in proportion; for we may be assured that there is then present a sthenic state of disease with considerable power. Gooch* has a remark which could only have emanated from an observant and practical mind, that "the effects of remedies on disease form not only an essential, but the most important part of the history of the disease;" and this is well exemplified in regard to the use of the lancet in puerperal fevers, where the inflammatory, and what is called the adynamic form, so closely resemble each other, that it may be difficult to tell, without a "tentative bleeding," whether the loss will be sustained well or not.

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* All those who have seen most of the disease prefer giving a large dose of calomel at first; and I quite agree with Ferguson, that a small dose creates pain and irritation.

Blistering a large surface of the abdomen has been highly extolled by some authors; but I consider that many objections apply to the adoption of such means, at least in the early stage of the disorder; and the following are among the chief. In the first place, the common blister acts much too slowly for our purpose; the inflammatory disease is extending, and running on to the disorganisation of the structures implicated, with fearful rapidity; many hours will often elapse before any effect is perceptible, after the application of a blister. Again, the abdomen being covered by the plaster, prevents our having recourse to leeches, which are generally to be esteemed the more efficacious of the two, in subduing the morbid action. Besides, when the surface is denuded of its cuticle, and inflamed, we lose one of our best diagnostic marks as to whether the internal affection is on the increase or decline; for we may confound the tenderness of the blistered skin with peritoneal pain, and we may be consequently driven into a fatal mistake. When, indeed, the inflammatory disposition,—in a mitigated degree, perhaps,—still continues, after the abstraction of as much blood generally and locally as we think the patient will bear, blisters or other rubefacients may be employed with decided advantage; and, perhaps, of all, warm oil of turpentine, applied by means of flannels steeped in it, or the poultice as before recommended, will be found to answer best. Moore[*] says, in abdominal and pelvic inflammations he has obtained the most decided advantage from the application of blisters to the inside of the thighs. He thinks it an error to apply them too near the seat of disease. The application of a strong solution of iodine in sulphuric ether to the abdomen has been recommended by Mr. Hugh Norris, of South Petherton. He found it very useful in erysipelas, and, reasoning by analogy, was induced to try it in puerperal peritonitis, which he did with apparent benefit.[†] I can see no objection to this practice being followed; but I have not myself had an opportunity of testing its value.

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* On Peritoneal Fevers, p. 35.

After the bowels have been freely opened, great benefit may be derived from the exhibition of calomel and opium at stated intervals. Three or four grains of the former, and a third, or half a grain of the latter drug, or an equivalent quantity of Dover's powder, may be administered every two or three hours, until either ptyalism is produced, or the abdominal tenderness disappears. The object of the calomel is to arrest the inflammatory process, and prevent the effusion of fluid into the peritoneal cavity; and the opium is serviceable as well by quieting the patient, and perhaps inducing sleep, as by preventing the calomel irritating the bowels, and causing excessive purging. An occasional saline draught, to determine to the skin, or what is better, eight or ten grains of the uncombined carbonate of potash in solution, may also be advantageously taken. In very many instances an enormous quantity of mercury has been swallowed, without the mouth being at all affected;[‡] and in those, where salivation was induced, recovery has in general followed. For this purpose Velpeau[§] first proposed mercurial inunction, a means which I have not often adopted, but which I think may be advisable in many cases.

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[*] Op. cit. p. 234.

[†] See Med. Times and Gazette, Dec. 11, 1852, p. 590.

[‡] Collins notices this fact, which quite accords with my experience; he gave to one patient three hundred and eight grains of calomel in twenty-four hours; she recovered; and another woman took an ounce. Indeed, most authors recommend that this medicine should be exhibited with almost as lavish a hand as is customary in the acute diseases of Asia. Ferguson (p. 224) says ptyalism creates infinite distress, without affording any benefit. Moore (p. 226) thinks mercury does not often possess any power to check the course of the disease; while Rigby (p. 276), Ingleby (p. 432), and most writers commend it; and Ceely (Lancet, March 7th, 1835) says that nothing but rapid salivation affords a chance of safety. Gooch (Op. cit. p. 60) says of an epidemic he witnessed at the General Lying-in Hospital, all who were salivated recovered; "there might be, but I do not remember an exception."

[§] Revue Médicale.

Emetics, especially ipecacuanha, were formerly strongly recommended by some practitioners; and the most exaggerated accounts were circulated through Europe of the benefits derived from them in the practice of Doulcet, at the Hôtel Dieu, towards the close of the last century.* From the excessive tenderness of the abdomen, and the increased distress occasioned by the action of vomiting, emetics would, *à priori*, appear contra-indicated,—nor, indeed, have they been found to answer the expectations formed of them; and few practitioners of the present day rely upon, or even employ them. Barlow,† however, found them very useful; and if the disease were ushered in by vomiting, I should recommend their administration. Antimony in small quantities, and digitalis also, have been beneficially employed; and, in conjunction with the other antiphlogistic means already spoken of, may tend to subdue the inflammatory disposition. They should not, however, be trusted to exclusively; and the greatest objection to their employment consists in their liability to occasion vomiting, or sudden depression.

The internal use of the oil of turpentine, in doses of from three to six drachms, has been much extolled by Dr. Brenan, of Dublin; and Dr. Douglas‡ seems to consider it more efficacious than any other medicine yet proposed. I have myself no faith in the power of turpentine to put a stop to peritoneal inflammation,§ though I am persuaded I have seen it of service in some puerperal affections, particularly in the disease I shall next describe—acute tympanites. Stevens's celebrated saline mixture has been much recommended; where I have tried it, I have seen no advantage from it. Locock‖ thought the result not encouraging; and Ferguson[*] says he has neither seen it do good nor harm. Rigby,[†] however, speaks of it as likely to afford benefit, though the patients object to it from its intensely saline taste. Professor Michaelis, of Kiel, has used ice in this complaint successfully, both internally and as an external application. A piece of ice, about the size of the finger, was given to the patient every half or quarter of an hour, and was very grateful. Ice was applied to the abdomen in a bullock's bladder at the same time. In 1813, Dr. Sutton proposed to apply a high degree of cold to the abdomen, in peritoneal inflammation, and Ceely found in the epidemic at Aylesbury, that cold evaporating lotions used to the loins, abdomen, and vulva, alleviated pain, repressed tympany, and proved more grateful to the patient than fomentations. Ingleby[‡] thought the same advantageous in one case where it was tried. If the lochia be suppressed, or possess a bad odour, which is almost always the case, the vagina may be syringed every four or five hours with warm water, or a weak solution of any of the chlorides. Collins[§] thinks highly of the warm bath, as do some continental physicians; but the pain experienced by the patient in moving, and the difficulty in efficiently administering it, preclude its use, in my opinion. Nor do I conceive the hip-bath, which was used by Desormeau in almost every case, could be resorted to with less distress. It is scarcely necessary that I should insist on the sparest diet only being allowed, while we are pursuing the plan I have just detailed.

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* It was in the year 1782, when this disease raged with such violence in the hospital, that Doulcet resigned his charge to another. Passing through the wards one day, he observed a woman vomiting at the commencement of the attack; and considering this an effort of nature, set up for a salutary purpose, he gave her an ipecacuanha emetic, and she recovered. Two hundred were afterwards saved by the same means, and it is said that only six, who refused to take the medicine, died. The news of Doulcet's success was received through France with the enthusiasm so peculiar to the French people, with little less indeed than that with which a few years before M. Alphonse le Roy's operation of symphyseotomy was hailed; the government largely remunerated Doulcet, and the mode of exhibiting the specific, as it was considered, was circulated over the whole of France by the faculty of medicine. The very next year another epidemic, similar in external characters, arose in the same hospital; and Doulcet's remedy as signally failed in success as it had the year before appeared beneficial.

"Doulcet's method was put into my hands many years ago by Dr. Gooch to try; I used it empirically, and, therefore, injudiciously; but the lesson I then learned was, that in many instances it increased the torture, without shortening the malady." Ferguson, p. 205.

† Ingleby, paper before quoted, p. 432.

‡ Dublin Hospital Reports.

§ Gooch (Op. cit. p. 61) says, the result of the internal use of the oil of turpentine was not encouraging; but it was of advantage as an outward application.

‖ Page 361.

It must of course be understood that the practice above recommended is only applicable to the first stage of peritonitis, while the inflammatory symptoms are running high; whenever the second—that of depression—has arrived, the continuance of such treatment would invariably tend to hasten the fatal termination. Our system must then be entirely changed, and our object should be to preserve, as much as lies within our power, the remaining strength, so as to afford Nature an opportunity of counteracting the effects of the previously existing excitement. This should be attempted by sustaining the patient's system by a liberal supply of easily assimilated nourishment, and by the exhibition of stimulants and cordials. Brandy, therefore, in any proper vehicle, wine, ether, ammonia, opium, aromatics, and bark, are those which afford us the best chance of success, however small that may be. If there be present unequivocal indications of effusion having taken place within the abdomen, I fear art can render little service. Nevertheless, some cases are on record in which it is believed that the fluid was evacuated externally by abscess; and others where, after some time, tapping was adopted, and the

[*] Page 226.

[†] Page 295.

[‡] See Ingleby's paper, p. 434.

[§] Practical Treatise on Mid. p. 394.

patients survived; such, indeed, have never come under my own observation. They would teach us, however, not to give up the patient in despair, even when the case presents the most formidable appearances.

Since inflammation of the peritoneum is a disease so violent in its character, and so rapid in its course, and since its features are occasionally so suddenly changed from those of high excitement to others of extreme debility, it becomes our duty to be in constant attendance, or never to leave the patient for more than two or three hours at a time. The physician, indeed, under such an acute attack, should almost act the part of nurse; for the patient's safety will depend on the symptoms being narrowly watched, and on our immediately taking advantage, or endeavouring to counteract the effects, of every little alteration that may appear.*

If the disease is more chronic in its character, an aphthous condition of the mouth will often show itself; under which circumstances, the late Dr. A. T. Thompson strongly recommended the biborate of soda in rather large doses; † and he thought, if given in the infusion of calumbo, that its powers were augmented.

Every one must acknowledge that this subject is beset with great difficulties, both in description and practice; and these difficulties are increased by the fact that the various epidemics, whose histories we possess, have differed much from each other, being modified by the constitution of the atmosphere, and partaking much of the character of the then prevailing diseases. What Sydenham has designated *the constitution of the year*, has scarcely been taken into account in the treatment of these diseases; this, however, it is of the utmost importance to attend to; for we shall invariably find that, if the common fevers of the season bear depleting well, the same means will prove efficacious in arresting the puerperal diseases that may be at the same time rife; while, on the other hand, if the typhoid type prevail, the lancet must be employed with a more sparing hand.

I cannot finish this paper without again inculcating a caution, (which I would wish to do in the strongest terms that language can convey), respecting the possibility of our own persons being the means of such a dangerous malady spreading further. I have already said that some great authorities deny the contagious nature of the fever we have been considering. This opinion is no doubt founded upon good grounds, and is, as far as their observation has gone, I trust, tested by experience. Others, however, there are, who look upon it as the most easily communicable of any disease which we know in this climate; and whichever of these *theories* we may choose to adopt, we shall be acting on the safest principle, as far as the health of the community is concerned, and most wisely as regards our own individual puerperal patients, if *in practice* we take such precautions as would suggest themselves did we believe it to be eminently contagious.* I would therefore impress upon the mind of every reader the propriety of changing his dress after visiting a patient labouring under this affection, before proceeding to any other duties; and should it unfortunately happen to him to meet with two cases of the same kind in succession, to forego for some time his attendance on women in labour, at any pecuniary sacrifice, rather than run the risk of carrying into their chamber the dormant seeds of puerperal peritonitis.

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* "She should be visited many times a day. A careful note should be taken of the state of her pulse; you should set down on a sheet of paper the rate of her respirations, and insert memoranda of all the great points; the doses of medicine and the sensible effects produced by them should be recorded." (Meigs on the Puerperal Fever.)—"The practitioner can hardly do his duty without seeing the patient so often that he almost lives with her, and becomes not only her physician, but her nurse." (Gooch on Peritoneal Fevers, p. 99.)

† Lancet, July 3, 1839, p. 342.

ACUTE TYMPANITES.

I have chosen the term *acute tympanites* for the disease I am about to describe—although only a symptom—because I think it sufficiently characterises the affection I wish to distinguish. It is, indeed, the same, or at least a variety, of what is so well treated of by Dr. Marshall Hall, as *intestinal irritation*; † and the reason I have not adopted the designation he employs, is, that many cases of intestinal irritation occur after parturition, without being attended with the peculiar symptom to which I wish particularly to call the attention of my readers—the sudden and excessive tumefaction of the abdomen, accompanied by intense pain and great depression.

This affection bears a strong resemblance in many of its phenomena, to puerperal peritonitis; but the similitude is more apparent than real: the diseases possess no analogy with each other, either in their nature, cause, or mode of relief. It is true that both are often ushered in with shivering, both attended by extreme pain, abdominal tumefaction, suspended secretions, fever, and other morbid actions, as will be learnt when the symptoms of this complaint are detailed; but there is this essential difference, that tympanites does not originate in inflammatory action of the serous membrane, which in peritonitis is acute; nor is it removed by venesection; neither is it in any degree so fatal as inflammation of the peritoneum; and my observation perfectly bears out the opinion put on record by Marshall Hall, that when it does terminate fatally, "the event is to be attributed to the misuse of remedies, and especially of blood-letting." I have long been convinced that the disastrous consequences attendant on the disease under consideration were referable to its having been mistaken for peritoneal inflammation, and treated accordingly: and I am equally persuaded that, in the majority of cases, if, instead of depriving Nature of those powers on which we ought chiefly to rely for a restoration to a healthy state, we were to husband her resources, and content ourselves with simply counteracting the morbid symptoms as they arise, we should find that she was all-sufficient for the subdual of the disorder.

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* The best paper, in any language, with which I am acquainted, written to prove the highly contagious nature of puerperal peritonitis, is by Dr. Oliver Holmes, and published in the New England Quarterly Journal of Medicine and Surgery, Boston, April, 1843, p. 503. It is a masterly performance, and well worth perusal by any sceptics on the subject.

† On some of the Diseases of Females, 1827, p. 194.

Symptoms.—The attack mostly commences two or three days after delivery, and is usually introduced by a rigor; this is often very severe—more so, indeed, than when it precedes peritoneal inflammation. To this succeed great heat and dryness of skin, which, also, is often more intense than in peritonitis. I have already said, that in peritoneal inflammation the surface is sometimes soft and moist from the commencement; but this I never remarked in the affection now under consideration. The pulse rises rapidly in frequency, often beating one hundred and thirty or one hundred and forty strokes in a minute; sometimes it is fluttering and tremulous; at others fuller and firmer than in peritonitis. The mouth is generally dry; the tongue occasionally furred, or it is harsh and red. The countenance becomes early changed, though it does not express the same anxiety as in peritonitis. Most severe pain in the head is experienced, with intolerance of light and noise, uninterrupted wakefulness, and in many cases even delirium. Very early in the disease the abdomen swells inordinately and rapidly, becomes very tense and painful, and the transverse colon particularly can in many instances be distinctly traced: pressure aggravates the sufferings. The milk ceases to be secreted; the lochia are generally suppressed; there is great languor; an unwillingness to speak, or take nourishment; the patient lies on her back, with her legs drawn up, unsolicitous about herself, her infant, or her friends; the bowels are obstinately constipated.

This disease, like peritonitis, sometimes shows itself as an epidemic, or follows the practice of one particular individual; more frequently, however, it is sporadic in its character. As it gains ground, the belly increases in size, pain, and tightness; the tongue becomes dry and brown; there is hiccough, or vomiting of offensive matter, muttering delirium, subsultus tendinum, and most of the symptoms that denote the last stage of fever; but if recovery is to be expected, the swelling and tenseness of the abdomen subside; the pain gradually goes off; the pulse becomes slower; the tongue moister; the skin cooler and softer; there is no vomiting; the intellects remain unimpaired; a desire is expressed for food; and the bowels act, together with the expulsion of a large quantity of flatus.

Diagnosis.—The symptoms of this disease are so nearly identical with those of peritonitis, that it is most difficult to draw any distinctive mark between the two. The only prominent circumstance in which any difference can be observed, perhaps, is the time when the swelling of the abdomen takes place. In peritonitis this tumefaction is the consequence of inflammatory action, and depends partly on effusion of fluid into the peritoneal cavity, though principally on inflation of the intestines; and it does not appear until the disease has existed for some time. Pain, then, is the first symptom, and the swelling occurs afterwards. But the order is reversed in tympanites; the swelling occurs here in consequence of the rapid effusion of gases, and the pain is subsequent, and produced principally by the distension of the intestines themselves, combined, perhaps, with a morbid condition of the nerves. This, although but one diagnostic sign, is the best I can point out, and will, I think, generally enable us to discriminate between the two diseases. I may add, too, that in peritonitis the woman, as before remarked, generally expresses great anxiety about the result of the case, carefully scanning the countenance of her medical attendant, that she may, if possible, read in it her probable fate. In the disease now under consideration she is listless and apathetic; and, although she may be aware of it, so thoroughly is her nervous energy prostrated, that she appears totally unconcerned about her approaching end.

Cause.—The immediate cause of the swelling is evidently a sudden evolution of gas into the cavity of the intestines, under a weakened state of their muscular fibres; and the remote cause may most probably be referred to some peculiar irritation, or vascular excitement, existing in the mucous membrane lining the principal portion of the alimentary tube, and this is frequently called forth, at least among the poor, by irregularities in diet. If inflammation exists at all, it is in the mucous, and not the serous coat of the intestines; and the inability of this disease to bear up against copious abstractions of blood forms no exception to the history of mucous inflammation in general.

Treatment.—In the treatment of the case, our principal reliance must be placed on warm purgatives and carminatives; the object being to favour the expulsion of the gas, to keep up the patient's strength, and to restore its tone to the muscular coat of the intestines. With this view, we may give, in the first place, a full dose or two of senna and jalap, combined with aromatic confection, spirit of cinnamon or nutmeg, tincture of ginger, or any of the warm spices. If the bowels do not answer to this means, an aloëtic or common injection may be employed; and if the stomach contain undigested food, an emetic will be serviceable. Should the pain in the head be very severe, we may venture to apply leeches, or the cupping-glasses, to the temples, or we may have recourse to blistering with advantage; but I consider that in a pure case of this kind, bleeding from the arm is not indicated, and can seldom be borne with impunity. Of all internal medicines, turpentine seems to me the most useful; two or three drachms of the oil may be given for a dose, suspended in mucilage, or mixed with the white of an egg, and repeated every four hours; and if the stomach reject it, or the patient refuses to take it, from its nauseous qualities, an ounce, or an ounce and a half, may be thrown into the rectum. I am much inclined to think, from personal observation, that most of those cases of "puerperal fever" which yielded to the exhibition of turpentine, were indeed instances of the disease now under consideration; and in this opinion I am supported by Dr. Hall, who, in speaking of the spiritus terebinthinæ in peritonitis, and the favourable result of Dr. Brenan's system, says—"I much suspect that many of these cases were not inflammation, but intestinal irritation."

After the bowels have been freely relieved, a full dose of opium may be advantageously administered; and when the disease is on the decline, and the abdomen subsiding, we shall find saline medicines, or tonics, useful, as the features of the case may require. The external application of warm oil of turpentine to the abdominal surface, in addition to other means, may prove highly valuable.

A properly regulated diet is of the utmost importance; it should be nutritious, easily digestible, and given at short intervals. Even moderate stimuli may be allowed; but I think a large quantity of diluent drink should be avoided.

It is also highly necessary that the patient should be kept in a state of perfect quietude, and her apartment moderately dark; for, at the commencement of the attack, both light and noise, or indeed any excitement or disturbance of whatever kind, tends much to aggravate the symptoms. If it can be endured, a broad bandage placed around the person, and drawn sufficiently tight to give some support, may be employed; but generally the pain, till towards the decline of the disease, is so much increased by pressure on the abdomen, as to render any kind of bandage unadvisable.

It is not always, indeed, that we meet with intestinal irritation in this, its most simple form; but it is occasionally combined with inflammation in a greater or less degree, presenting a mixed case, whose features partake of the character of both diseases. It will then, of course, be proper to pay the chief regard to the inflammatory symptoms, and use appropriate measures for their subdual.

From what I have just said, it may be gathered that in those cases of the disease we are now discussing, which have proved fatal, no morbid appearances, sufficient to account for death, have been observed on dissection. I have myself seen some, but comparatively few, such. Dr. Hall tells us that many years ago he met with several;* Gooch also details some cases in which there was intense pain of the abdomen, attended with a highly tympanitic condition, quick pulse, hurried breathing, and great oppression, where the peritoneum after death was found healthy, and natural, there being no effusion of serum, nor lymph, nor any adhesions, nor other signs of previous inflammation. These cases were relieved by opium and fomentations, while bleeding and purgatives did harm.† This talented and observant physician has put on record his opinion that "peritoneal fevers may occur in their most malignant and fatal form, and yet leave few or no vestiges in the peritoneum after death."‡ He remarks in another part of his valuable essay, "there seemed to be nothing dangerous in this form of disease, provided the nature of it was not mistaken, and improper remedies used; yet it so *strikingly resembled* peritoneal inflammation, that it was invariably taken for it by the practitioners who witnessed it."§ I cannot believe that such cases as these depend on any peritoneal affection at all: and therefore I should consider the name of "peritoneal fever," given to them by Gooch, as misapplied, and by no means justified: above all I think it impossible for any form of inflammation of the peritoneum to destroy life without leaving behind it very visible and distinctive marks of its deadly incursion.||

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* Op. cit. p. 200.

† On peritoneal fevers. See cases ix. x. xi. xiii. xiv., to which also I would be inclined to add xv.

‡ Page 96. § Page 73.

|| Denman (chap. xix. sect. 1; in 4th edit. p. 636) has a passage that bears directly on this subject: "We have been told that in the dissection of some who are said to have died of puerperal fever no appearances of inflammation have been discovered; but I should suspect that in such cases some important appearances had been overlooked, or that errors had been committed as to the nature of the disease, and probably in its treatment."

FALSE PERITONITIS.

There is another affection of the puerperal state, somewhat similar to the last in many symptoms, but differing from it in its chief feature, there being no tympanitic swelling of the abdomen. This was first described by Gooch, and is called by Ferguson *transient*, and by Locock and Rigby *false, peritonitis.* Under the latter name, it has been long known at the General Lying-in Hospital; though Rigby confesses that it is rather convenient than correct. It generally occurs during the prevalence of puerperal peritonitis, especially when the violence of the epidemic is a little on the decline, appears within a day or two after labour, and is characterised by the most acute pain in the abdomen, simulating inflammatory suffering, but not occasioned by inflammatory action. In some cases the abdominal tenderness is preceded by shivering or a chilly sensation; its onset is sudden; and it rapidly reaches a degree of intensity little inferior to the anguish in the worst forms of inflammation. It is not attended by suppression of the milk or lochial discharge, the pulse is generally but little accelerated, the skin not much increased in temperature, the tongue natural, the intellect perfect; and though pain in the head and loins may be present, this is comparatively trifling.

This affection, violent as the symptoms appear, will give way to a full dose of opium, the power of which drug seems to be increased by the addition of three or four grains of calomel. Ferguson has detailed at length some cases of the disease. He tells us* that in the epidemic winter of 1827-28, this form was so prevalent along the banks of the Thames, that, being worn out by incessant calls to visit the patients at their own houses, he directed the matron of the hospital to send, in the first instance, to all complaining of abdominal pain, two doses of Dover's powder, containing ten grains each: one to be taken immediately, and the other in four hours; if after this the symptoms did not give way, they were directed to apprise him. After he adopted this plan, he had no occasion to visit one in five of those afflicted, as they did not require any other treatment. A few pages farther on he says, "In all, we must conclude, that the malady is a genuine puerperal fever, the peculiarity of which consists in its being within the reach of such simple remedies, as merely allay pain and subdue congestion, by promoting the secretions of the intestinal canal and the skin." He thinks, too, "that a severe bleeding will give to that which was transitory a permanent character; and that what might have been removed early by appropriate remedies becomes a formidable disease." In two of his cases, Nos. ii. and vi., the pulse was never above 80; in vii., 100; and in ix. and xi., 90. In some certainly he states that it rose to 120 or 130, and in many he does not mention the pulse at all.

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* Page 16.

To call such an affection as this puerperal fever is to invest it unnecessarily with a very alarming name, and to mislead, by inducing a belief that one form at least of the frightful malady, which bears that designation, may be cured by following a plan perfectly inadequate to the removal of such a fatal disease.

Women of weak frame and delicate sensibilities are more liable to an attack than the stronger and more robust; indeed the pain appears to me altogether neuralgic, and the disease to partake much of the hysterical character. Rigby thinks it is situated in the muscular coat of the intestines and the abdominal muscles rather than in the peritoneum; and in this opinion I quite agree; for the least movement will often throw the abdominal muscles into violent cramp-like contractions, and even the dread of being touched will produce the same effect. If, however, we can persuade the patient to allow us to apply our hand over the abdomen, she will bear gradual, steady pressure, not only without an increase of suffering, but even with relief. The sudden withdrawal of the hand causes as much pain as sudden pressure, but if it is removed carefully and slowly little uneasiness is felt. It is supposed that this affection will quickly pass into acute peritonitis or into the typhoid state of the malignant form, and that the latter is almost certain, if it has been mistaken for an inflammatory attack, and treated antiphlogistically.* That bleeding largely will convert this complaint, otherwise devoid of peril, into one of great danger; or rather that it will occasion such a shock to the constitution, as will dispose the patient to become the subject of typhoid fever, I can readily imagine; but I look upon it as so distinct from peritonitis, that I do not see how the one disease can pass into the other. Where peritonitis is well developed, the pain is inflammatory from the very commencement, and not merely neuralgic, as is the case here.

It is of the utmost importance to distinguish this from a truly inflammatory state; because, as I have already said, puerperal peritonitis requires active bleeding and purging, and that at the very onset of the disease; whilst the same mode of practice would be assuredly highly detrimental, if not fatal, in this. Dr. Gooch attributed, and I think with reason, the death of all the patients whom he saw sink under it, to its nature having been mistaken by the previous attendant, and antiphlogistic measures having been vigorously pursued. The diagnosis is so difficult, that even skilful and experienced practitioners are very likely to err; and in proportion to the difficulty is it necessary to be precise in laying down discriminating marks. On this subject, then, I cannot do greater service to my young readers than transcribe the words of Gooch, who seems to have paid unusual attention to the cases that he saw. "There is reason to believe that this form of the disease is present when the patient in her ordinary health is delicate and nervous—when the pain and tenderness have followed any irritating cause, such as severe afterpains, or a griping purge—when the pulse, although quick, is perfectly soft and weak; and this opinion is strengthened if blood has been drawn without relief, and without the signs of inflammation on its surface. The best way of treating these cases is to wash out the large bowels by a very large clyster, to give ten grains of compound powder of ipecacuanha every three hours, till the pain is gone, to keep the abdomen constantly covered with a warm linseed meal poultice, and after the pain has ceased, if the abdomen continues sore, and the pulse quick, to apply leeches, and give a mild purge. When I doubt the nature of the case, I apply leeches at the beginning."* To this I may add, that when the constitution of the patient is decidedly hysterical, four or five grains of camphor may be added to each dose of the sedative, and when the alarming symptoms have passed away, and the patient continues in a weakly or a faint condition, any of the vegetable tonics with ammonia, will be found useful. We shall commit a grave error if we restrict the patient under this complaint to a very spare diet. Women of a delicate and nervous temperament will not bear being kept low; and those who have been accustomed to indulge in wine or spirits must be supported and sustained by a more generous diet than we are in the habit of prescribing so soon after labour. Many, especially among the poorer classes, will even require stimulants; and in the lying-in hospitals at different times, gin-caudle has been found an excellent addition to the medical treatment.

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* Rigby, Lib. Med. vol. vi. p. 281.

PUERPERAL TYPHUS.

Another disease which has been confounded, in consequence of the name applied to it, with peritonitis, is a fever allied to typhus, of the most aggravated description. To this the term *puerperal fever* would be peculiarly proper: and it might be retained if it had not already been employed in so vague and undefined a sense. Typhus, indeed, is very rare in the puerperal state—the most uncommon, probably, of all the affections which have been described under this denomination. It commences at the time after delivery most usual for serious disease to begin—about the second, third, or fourth day. It is perhaps ushered in by shivering, but this is by no means always the case. This is followed by the most severe pain in the head, and along the spine, accompanied with great depression of spirits, mental agitation and inquietude, frequent sighing, a tremulous movement of the hands when raised, general restlessness, and palpable evidence of extensive injury inflicted on the nervous system. Soon pain in the belly is also complained of; the abdomen swells somewhat, the countenance becomes dejected, and the eyes are much sunken. The tongue is early coated with white fur, the pulse very quick, and the skin hot and dry. There is usually suppression of milk, and sometimes of the lochia. Vomiting seldom occurs in the first stage, and the bowels are easily acted upon. When the disease is running on to a fatal termination, the tongue very soon becomes dry, brown, and raspy; the pulse is quicker and weaker; there is low delirium; the belly swells from intestinal flatus; there is vomiting of dark matter; laboured respiration; coma; and, indeed, all the symptoms of the worst kind of typhus.

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* Diseases of Women, p. 106.

I have no doubt this disease is propagated by contagion; and it may be excited by a loaded state of bowels, and perhaps by anxiety of mind, and other similar depressing causes.

Treatment.—Except in the early stage, bleeding from the arm will be generally improper, and even then, should be restricted to plethoric patients. Our principal reliance must be placed on purgative medicines, aided by mercury and salines; but I fear the power of remedies in subduing this disease will be found but trifling. In the first instance, a few leeches may be applied to the temples or forehead, or a blister may be placed over the nape of the neck. A full dose of calomel should be exhibited, which must be followed up by purgative medicine; and after free evacuations have been procured, small quantities of calomel and opium should be given at short intervals, with saline medicines. The cathartics will generally cause the expulsion of a large quantity of dark, fœtid, offensive stools, with hardened skybala, which have remained pent up within the bowels for a long time. I think it would be unwise to continue with the purgative plan when the intestines have been entirely unloaded, because of the depression which must accompany the drain from the membrane, but esteem mercurials and salines, or tonics, stimulants, and carminatives,—according as the disease displays features of excitement or depression, as the most useful remedies. In the low state, bark, camphor, and ammonia, appear particularly indicated.

An instance came under my own eye some years ago, in which this disease spread among the puerperal women of a healthy neighbourhood, at a few miles distance from London, having evidently been communicated from one patient to the other through the medium of the attendants. I was requested, late one evening, to go about seven miles into the country, to the wife of a medical friend, who had been delivered the preceding day, and whose labour had been perfectly natural. I found her suffering under a disease which I considered to be a species of typhus; it certainly was neither inflammatory nor simple intestinal irritation. My friend designated it "puerperal fever," and, acting upon preconceived notions, was very desirous of bleeding her. To this I objected, stating that I relied more upon purgatives, and that I was perfectly persuaded the loss of but a few ounces of blood from the arm would irrevocably depress her. Eight or ten leeches were applied to the temples, and a dose of calomel, followed by a strong but warm purgative, was administered. The medicine caused the expulsion, during the early part of the night, of a larger quantity of highly offensive feculant matter than I ever recollected to have seen voided within the same time; after which she expressed herself as very materially relieved, went to sleep, and in the morning was comparatively restored. Having remained in the house all night, I returned to town, promising to visit her again in the evening, and expected to find her then still better. It happened, however, in the course of the day, that a relative, an old practitioner, living in the neighbourhood, called, and on seeing her, immediately declared the disease to be puerperal fever, wondered that I should have been so remiss as not to have bled her, declared it in his opinion absolutely necessary, overruled my friend's objection, and, without delay, placed her in the semi-upright posture, and proceeded to abstract blood from the arm. Before six ounces were drawn she fainted, and remained so long under that state, that my friend became exceedingly alarmed, started immediately for town, and took both my father and myself back with him. When we arrived, we found the powers of life ebbing fast, and she died within four or five hours after the bleeding, never having rallied from the impression first produced. My friend then informed me he had another patient labouring under exactly similar symptoms, whom he had attended the same day on which his wife was delivered; that, acting on the same feelings his relative entertained, he had bled her; that she had fainted from a very small loss; and that she was then, he feared, dying. Another relation of his who had watched both these cases, attended, previously to their death, a patient, who was attacked in the same way, and who died, with the same kind of symptoms, some hours after having been bled; and the woman who nursed my friend's unfortunate wife, went from his house directly to that of another lady, who was taken in labour a few hours after her arrival, was soon seized with the same disease, was also bled, and died as rapidly as the other three. She was attended by a different practitioner, who had not seen any of the previous cases. It then became evident that the disease was communicable, and the greatest precautions possible were taken to prevent its spreading; notwithstanding all the care that could be used, some other cases occurred: the depleting system, however, was not persevered in, and no more deaths took place. Of all the instances that ever came under my notice, these most strongly convinced me of the danger of acting upon preconceived theoretical notions in the treatment of disease; and I have little doubt that if the phrase "puerperal fever" had not been in existence, these patients would have been treated differently, and that with a better chance of recovery.

HIDROSIS.

The term HIDROSIS,[*] or HIDROTID FEVER, has been given by Dr. Blundell[†] to a highly dangerous disease of the puerperal state, differing from any that I have yet touched upon; and the name has been chosen from the most prominent of the symptoms attendant upon it,—a profuse and distressing perspiration. It is not of common occurrence, is met with in every variety of intensity from a comparatively mild form, to one of extreme severity; and not unfrequently it results in a fatal termination.

Dr. Blundell has noted seven varieties, which he has called "the ultra-malignant,—the malignant,—the acute,—the lingering,—the mutable,—the fugacious,—and the remittent:" but this minute division, as I think, tends rather to embarrass and confuse, than to lead to any distinction of practical value. As well, indeed, might we attempt to arrange under different heads the varieties of each common febrile or inflammatory affection that we meet with in practice, according to the rapidity of its progress, the violence of its symptoms, or the peculiarity of the constitution, which it may happen to have attacked.

Hidrosis might, with some show of propriety, be classed as a species of puerperal fever; but the vague and indiscriminate manner in which that phrase has been applied would induce me to endeavour to curtail its meaning, rather than to extend it; I have therefore chosen to treat of this affection under a separate article.

History and symptoms.—Hidrosis usually first shows itself within four or five days after delivery, and is almost invariably ushered in by more or less of rigor. Like most of the dangerous puerperal diseases, the sooner it appears after labour the more severe are the attendant symptoms, and the greater is the impendent peril. It has sometimes supervened on miscarriages of an advanced date; and whenever I have seen it under such circumstances, it has always been preceded, and, I think I may say, excited, by a large loss of blood. Speedily after the shivering, or cold sensation, a degree of heat is experienced, which soon disappears, and gives way to an universal diaphoresis, in profuseness and intensity greatly beyond what might have been expected from the slightness of the two preceding stages. This copious sweating, far from being a relief, brings with it a feeling of the most abject depression; the pulse, which had risen rapidly, does not become less frequent as a consequence; the thirst, generally from the commencement urgent, does not abate; and no mitigation takes place in any of the symptoms. The cuticular secretion exhales a most unpleasant odour; it is very different from the pungent, acid smell, accompanying miliary fever; and yet is always equally characteristic. It most resembles the smell of newly-turned earth; and the breath also is faint and sickly. As the disease progresses the pulse continues to rise; but it often varies in a manner that is exceedingly unusual; at one period of the day being comparatively slow,—at another almost countless; and this alteration goes on day by day, until either the disease abates, or collapse and prostration supervene. Its average frequency is between 100 and 140 beats in the minute. It is seldom firm or hard, generally soft and small; but sometimes round and bounding, and yet most easily compressed. The tongue is almost always moist and slimy; it is seldom thickly furred, or raspy, even in the last stage; occasionally it bears throughout a perfectly healthy look; and never have I remarked it morbidly red, as it often is under intestinal irritation. The secretion of milk is soon suspended or much diminished; and the lochia either cease altogether, or, what is more common, become scanty and fœtid. The bowels act easily, and the motions are offensive, or unhealthy in colour. Diarrhœa, which it is difficult to check, often sets in, even early in the complaint. The urine, notwithstanding the patient is constantly bathed in perspiration, is plentiful, and occasionally secreted in preternatural quantity. The heat of skin is not above the ordinary standard; and the sensorium is not *violently* disturbed. The state of mind, however, is often very peculiar; there is at one time present great apathy and listlessness; or, perhaps, no small degree of despondency and fear. At another time a quickness of manner may be remarked, or a degree of waywardness and pettish obstinacy, very foreign from the natural character; and then, again, a calm submission to everything that is recommended to be done. In some cases that I have met with, an intense interest has been evinced in things of trifling moment; and expressions of gratitude for small services rendered have been uttered with a fervency much beyond what the occasion called for;

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[*] From Ἵδρωσις, *sudatio.*

[†] Obstetricy by Castle, p. 770.

so as to lead to the suspicion that mania would soon break out. The countenance is usually placid; though pallid, bearing its natural expression; and very different from the haggard, anxious cast of features that accompanies the malignant form of puerperal peritonitis. The patient dozes, but only for a few minutes at a time; and these snatches of sleep are not refreshing, nor followed by any abatement of the febrile paroxysm. Pressure on the general surface of the abdomen does not give pain; but if the hand be applied steadily, and with firmness, over the uterine region, some expression of suffering is called forth. As she lies quiet, however, she complains of no abdominal uneasiness: the posture generally chosen is on the back, or inclined rather to one side, with the thighs slightly flexed. Sometimes erratic pains are present; and occasionally an acute pain in the side, similar to what is felt in pleurisy. If the disease does not give way to the means resorted to, the pulse continues to increase in frequency; the abdomen, sometimes, though by no means universally, becomes tympanitic: when it does so, the evolution of gas is generally rapid, and takes place only a few hours before death. Vomiting of an offensive matter supervenes, but almost without effort, and sometimes attended with hiccough; uncontrollable diarrhœa comes on; the respiration is hurried and irregular; and the patient gradually sinks into a state of complete prostration and collapse. Low, muttering delirium mostly appears before death. In these respects the termination of hidrosis resembles that of most of the dangerous febrile diseases.

There is reason to believe that this affection is communicable by contagion.* Whether this is the case or not, under our present slight acquaintance with its pathology, it is our duty to act as though we might be the means of conveying it from one puerperal woman to another; and, especially, after being concerned in a *post mortem* examination, should we use every precaution in our power to prevent the possibility of our persons being the agents of its spreading; for I am quite convinced that the contagious properties of puerperal diseases are rendered even more penetrating and subtle after death; and that articles of clothing, impregnated with the effluvium arising from opening the body of a woman who has died of a contagious puerperal malady, are the surest instruments of its further propagation.

Appearances after death.—The reported dissections of patients who have died of the disease bearing this name are so few, that much uncertainty attaches to its morbid anatomy. Blundell says he is not prepared to give a good account of the morbid appearances observed after death; and he therefore contents himself by hoping the defect may be hereafter supplied. After this acknowledgment I might be excused, did I follow his example; but some light has been thrown on its pathology since Blundell wrote; and it has happened to me to become acquainted with the results of a few *post mortem* investigations, since my attention has been particularly directed to the disease, as one of a distinct and peculiar nature.

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* In the Provincial Med. Journ. for Nov. 4th, 1843, there are five fatal cases given by Mr. Fisher, of Bungay, of a disease which, in many of its features, particularly the distressing sweats, resembled that I am describing, but in others materially differed from it. This sad affection was evidently propagated from one to the other by contagion, Mr. Fisher himself being the means of communicating it.

In all the instances that have come within my knowledge the peritoneum has been found healthy, the vessels not surcharged, the surface unchanged, except perhaps being a little duller than natural; no fluid, either of a serous or puriform kind, has been discovered in the abdominal cavity; nor have the ovaries, or other uterine appendages, exhibited any strongly-marked morbid appearances. The uterus itself has been well contracted for the time after delivery; and its external face has given no indication of diseased action. On cutting into its substance, the muscular structure has been in a healthy condition, no abscesses having been formed within its walls; and whatever morbid traces displayed themselves have been found in the lining membrane, and within the veins. Either this membrane has been in a turgid, softened, or semi-gangrenous state, or puriform matter has been detected, though not in large quantities, in the sinuses, or both these conditions have existed together. Not, however, that all cases of inflammation of the veins, where pus is formed, are attended with this sweating disease, as Dr. Lee's investigations sufficiently prove. In a well-marked and instructive case published by Dr. Lever,* the veins of the uterus, when laid open, were found either obstructed by coagula, or containing a fluid more or less purulent; and from some of them pure pus, from others pus mixed with blood, could be squeezed. The uterine lining was found of a deep peony colour; and at one part a number of very small dark spots were seen, like echymoses, some of which showed distinct marks of ulceration, through the membrane into the fleshy substance of the uterus itself. The pelvic vessels, and those communicating with them, both arterial and venous, were perfectly healthy; and the other organs of the body were apparently uninfluenced by the disease. Thus, then, we have good reason to attribute the morbid symptoms to the condition of the uterus; and I am myself inclined to connect them with the secretion of pus from the inner coat of the uterine veins, and its consequent introduction into the system, along with the circulating fluid, rather than with any other cause; so that perhaps it may be considered to originate in uterine phlebitis. In one well-marked instance, however, which I watched narrowly, not the slightest morbid appearance could be discovered after death, except some patches of abrasion, and indistinct ulceration in the mucous membrane of the large intestines. No pus was discovered in the uterine veins; and the blood which they contained, when examined by the microscope, showed no admixture of that fluid. In this case there had been excessive purging, almost from the beginning of the attack, as well as the characteristic sweats.

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* Med. Gazette, Sept. 9th, 1837, p. 862.

Causes.—That hidrosis is in some manner connected with the peculiar condition of the system incidental to the puerperal state is, I think, proved by its never being seen, as far as I know, in this climate at least, except after labour or abortion; and we are therefore fully warranted in looking upon the state of childbed as the chief predisposing cause. Blundell is of opinion that it may commence previously to delivery; and he has observed one or two instances where a shivering came on before labour, and this disease was established after: But in these cases the placenta was implanted over the os uteri and partially detached. In Lever's case, too, profuse perspiration appeared some time before the patient went into labour; though it had not the characteristic odour till some days after.

There is no question that some women would be more liable to take this disease than others, as is remarked of all morbid affections; so that we may consider some constitutions peculiarly predisposed to it; and most of the cases that I have witnessed have occurred in irritable, excitable, nervous habits. Noxious miasmata, and other unwholesome exhalations, or some unhealthy states of the atmosphere, may call it into being, in those who are disposed to become the subjects of it; but I am persuaded that the most frequent exciting cause is the loss of blood. For of those cases that have fallen under my notice I have not seen one where there had not been hæmorrhage during labour; and in the majority it has followed the removal of an adherent placenta by the hand introduced into the uterus. It is consequently fair to infer that in these cases it has been induced either by the loss that the system has sustained, or by some injury that the uterus has suffered. It has nevertheless been attributed to the presence of a putrid fœtus in the cavity, or to a portion of placenta which has been left behind and putrefied.

Diagnosis.—The chief diagnostic symptom is the characteristic diaphoresis, which even in the mildest cases possesses the unpleasant, earthy odour, that I have before alluded to,—which is not a critical evacuation,—and which brings with it such a feeling of exhaustion, as to have been aptly denominated the "sweats of distress." When this peculiar and profuse perspiration appears shortly after delivery, especially if the labour have been tedious, the child expelled putrid, the placenta been extracted manually, or much hæmorrhage have occurred, we may give this name to the disease; and our fears must be aroused to the presence of considerable hazard. The variable nature of the pulse, and the state of the patient's mind, will also assist us in detecting the nature of the malady which we are called upon to treat.

Prognosis.—As scarcely any affection of the puerperal state is more dangerous than that under consideration, so our prognosis in respect to recovery must be proportionably unfavourable. Even in the milder forms it is lingering and intractable, and disposed to result in some other disease. These cases have been known to end in abscess within the pelvis, or in the mamma, or in phlegmasia dolens, or in a maniacal condition.

In the more malignant form no one can for a moment overlook the indications of extreme peril that simultaneously arise. The prostration is such as we should attribute to the nervous system having received a sudden and severe shock, or to the introduction of a powerful morbid poison into the blood. We must not be deceived into the hope that the disease is giving way, if on one of our visits we find the pulse less frequent than before, even although the difference is great, because of its changeable nature in this malady; provided the perspiration remains profuse and distressing. In this, indeed, as in all other puerperal diseases, a *steady* fall in the pulse is to be looked upon as the best sign we can observe. There is no single indication of amendment I am inclined to rely upon so much as a *gradual* diminution in its frequency; but here, as I before remarked, the pulse seldom keeps at a steady average, but is constantly, hour by hour, varying in rapidity.

Treatment.—As in the epidemic variety of puerperal peritonitis, so in this disease, I fear the boasted power of medicine will be but of little avail; and more reliance must be placed on the strength of the patient's own constitution, than on any assistance that art can afford. Not a single case has come under my notice, in which I thought bleeding from the arm could be borne; but perhaps this may be attributed, in those that I have seen, to the copious hæmorrhage that has preceded the attack. The variable state of the pulse, indeed, sufficiently proves that the disease does not depend on acute inflammation; for when this is present in the puerperal state the pulse is steadily rapid. Should there be a fixed pain in the uterine or iliac region, or, indeed, in any part of the trunk, leeches may be applied; and usually eight or ten at a time will be sufficient; nor shall we require to repeat them often.

Strong purgatives will seldom be necessary; the thorough evacuation of the intestinal canal is certainly proper in all cases; but we shall almost always find mild aperients, and those in small doses, all-sufficient for the object in view. In general it will be more difficult to restrain the inordinate action of the bowels, than to procure stools. If aperients are required, a moderate dose of castor-oil, rhubarb, or decoction of aloes, will probably be the best medicines we can employ. It is difficult to bring the system under the influence of mercury; nor does that mineral appear to possess the same specific power in controlling the force of this morbid affection, which we justly attribute to it in most inflammatory diseases.

Tonics, carminatives, and stimulants, appear the most suitable remedies. Bark, especially quinine, in two or three-grain doses, repeated at short intervals, and the mineral acids, even from the onset, may be had recourse to; and the system must be sustained by any nutritious diet that the stomach can most easily assimilate. I think in most cases a liberal quantity of wine, or even brandy, may be allowed. During the progress of the case, opiates will most likely be called for, either to keep down nervous excitement, to procure sleep, or to allay undue intestinal irritability; but they should not be trusted to exclusively. The good effects arising from their use will be procured, by administering them in moderate doses; and opium itself, or the salts of morphia, will be found the most beneficial of this class of remedies. Ammonia, when there is great depression, will be indicated, and it may be given in combination with the decoction or extract of bark; or conjoined with other stimulants, alternately with quinine and the mineral acids; or with chalk and opium, if the bowels are much relaxed.

The saline system of treatment has not been productive of any good effect in two or three cases where I have seen it tried; nor should I be inclined to rely at all upon its efficacy. I need not insist on the propriety of taking off the hair, should the head be morbidly hot, or delirium be present; nor on the necessity of keeping the extremities warm by artificial heat, should their temperature fall below the natural standard. If the lochial discharge be offensive, much comfort and advantage may be obtained by frequently syringing the vagina with warm water. On the whole, I feel compelled to confess that no specific plan seems to possess any power in subduing the violence of this dangerous malady; and that our chief duty lies in combating the morbid symptoms as they arise, and in supporting the patient's strength by appropriate nourishment, stimulants, and cordials.

SCARLET FEVER.

SCARLET FEVER is one of the most formidable diseases that can assail the puerperal woman; and although not belonging particularly to that state, I have thought it worth while calling the attention of my younger readers to the subject, principally to put them on their guard against the possibility of themselves conveying the infection to a puerperal patient; and also to induce them to remove out of the infected atmosphere any pregnant woman who is near her confinement, should the malady unhappily break out in her family. Some calamitous instances have come within my own knowledge, where a valuable life might, in all probability, have been saved, had such precautions as I shall recommend, been acted upon.

It is a curious fact, and one quite in accordance with the beneficence of nature, that pregnant females are not so liable to become the subjects of infectious diseases, as other persons; indeed, that pregnancy seems, to a certain extent, to operate as a preventive and safeguard; but this immunity is more than counterbalanced by the unusual susceptibility their system evinces to take upon itself, after delivery, those unhealthy actions, from which they have been preserved while the fœtus was in utero. Agreeably to this law it is, that we frequently observe an infectious complaint run through a whole household, scarcely one of the inmates escaping its influence more or less, while the mother of the family, if pregnant, shows no signs of the disorder.* Should she, however, be taken in labour before the infection has expended itself or disappeared, she will almost invariably become attacked; and most likely the symptoms will be more acute in her case than it was in any of the rest.

These remarks eminently apply to scarlet fever; for this disease may lie dormant in the system for some weeks, and break out with fearful severity a few hours after labour. But not only may the seeds be implanted in the system during the gravid state; the infection is even more likely to be received after delivery; and it may be conveyed by medical attendants, nurses, or visitors, in the same manner as malignant puerperal peritonitis: while the instruments of its dissemination are themselves free from illness. It would seem also that when taken subsequently to delivery, it shows itself sooner after exposure to the exciting cause, and that a less period of incubation is required, than in the ordinary forms of the disease; although none of the contagious exanthemata follow so speedily upon the reception of the infection, as does scarlatina in general.

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* "Indeed I think we have sufficient evidence to justify the belief that pregnancy acts in a great degree as a protection against the reception of disease; thus, it has been observed, that during epidemics of different kinds, a much smaller proportion of pregnant women have been attacked, than of others."—Montgomery, Signs and Symptoms of Pregnancy, p. 25.

The symptoms are exactly those that usually attend its perfect development; but they appear in their most aggravated form. The scarlet rash, intense in character, is ushered in by rigors; first evident upon the chest, mammæ, and abdomen, it rapidly spreads to the extremities; the temperature of the skin is much increased; the milk, if it have been formed, quickly disappears; the lochia are sometimes suppressed or diminished, at others they continue to flow naturally; the pulse is very much accelerated, and is generally small and wiry; the breathing is hurried, and drawn with frequent sighs; the tongue soon becomes coated with a white crust, and puts on its peculiar character, the papillæ being eminent, and its edges and tip intensely red; the throat is always more or less affected, the tonsils and uvula display a deep scarlet colour, and are much swollen; sometimes a slough forms on one or both of the tonsils; but occasionally this does not occur, the patient appearing to sink before that process has commenced; the urine is diminished in quantity, and the perspiratory action, as far as can be made evident to the senses, entirely suspended; there is acute pain in the fore part of the head, and a throbbing in the eyeballs; the abdomen is soft and natural to the feel, pressure producing little or no distress; and the bowels are not difficult to be acted on. Unconquerable thirst attends the complaint from its beginning. Not unfrequently within a short time from the appearance of the eruption the whole surface is covered by innumerable small, miliary vesicles, such as have been noticed by Rush, Withering, Mason Good, Rayer, and Watson sometimes to attend the ordinary disease; the variety, indeed, which Sauvages has raised into a distinct species, under the name of *scarlatina varioloides*. As the disease gains ground, typhoid symptoms supervene, the surface still preserving its vividly florid hue; delirium occurs; and the patient sinks within three or four days from the first appearance of the efflorescence. So fatal is this malady in London and its neighbourhood among puerperal women, that, of the numerous cases which I have witnessed, two patients only have recovered; one of them in the most abject state of poverty, living in a crowded and unhealthy part of the town; the other residing in a high and salubrious spot six miles away, and enjoying all the advantages which affluence could bestow.*

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* Since the sentence in the text was written I have met with many cases of recovery under scarlet fever in the puerperal condition; and therefore I have now

Causes.—I have never seen scarlatina after labour, when there was not reason to believe it had its origin in infection. I think I have traced it to a child brought from a workhouse to relieve the breasts, when the patient's own infant could not suck, although that child seemed at the time quite healthy. I am sure I have seen it communicated both by medical attendants and by visitors; and it has arisen without any communication, either direct or indirect, with an infected person, when the disease was prevalent in the neighbourhood of the woman's residence. But by far most frequently it has originated in the patient, towards the close of her pregnancy, superintending the management of some of her own children at the time labouring under the complaint; and it matters not how mildly soever they may have had it, the chances are fearfully great that, if she becomes its subject, she will also be its victim.

Treatment.—It may be inferred from what I have said, that this disease is in the highest degree perilous, and that, for medical treatment to be of any avail, the patient must be watched with an *uninterrupted assiduity*. Depletion can seldom or never be borne. Even the application of a few leeches to the temples to relieve the distressing head-ache is followed by alarming exhaustion; and a sustaining, if not stimulating, plan is that most likely to succeed. The head should be shaved, and a cold lotion applied to the scalp as soon as the complaint is detected, the bowels should be moderately opened, and the surface should be sponged with vinegar and water, either cold or tepid, according to the time of year, and as the patient can bear it.* The bed curtains should be undrawn that she may breathe fresh air; a small fire, if the weather is not very warm, should be constantly kept up either in her own chamber, or, what is better, in an ante-room, to insure as perfect ventilation as can be obtained; all superfluous articles of woollen or stuffed furniture, about which infection may rest, should be removed from the apartment; and the floor may be sprinkled liberally, from time to time, with a solution of the chloride of lime. Those medicines which are likely to excite perspiration would seem indicated; but antimony, and even ipecacuanha, occasion too great depression in their action to be safe; and their exhibition is seldom productive of

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reason to regard it as a less intractable disease than I at one time believed it to be. All the patients that have done well under my notice, have been treated by large doses of ammonia, with other stimulants and cordials.

* I have never tried the practice of cold affusion as recommended by Dr. Currie and so strongly advocated by Willan and Bateman, in the more ordinary cases; and I should fear the shock would be greater than the constitution of a woman lately delivered would be able to sustain; but I have seen much comfort derived from, and a remission of the symptoms supervene upon, the surface being freely sponged with water as cold as could be procured.

the desirable object for which they are employed. The liquor ammoniæ acetatis in full doses may, perhaps, be beneficial; but the uncombined carbonate of ammonia is the medicine I trust to beyond others; and this particularly also from having observed its good effects in the scarlatina of childhood. Even from the very beginning, and in that stage when the surface is hottest, and the eruption most florid, I should recommend its administration in doses from five to ten grains at intervals of two or three hours; and if the least coldness in the feet or hands, or any falter in the pulse, show themselves, I would combine spirituous stimulants with the drug. All the patients who have got well under my care took largely of ammonia throughout their illness; and the recovery of some was certainly much assisted by the frequent administration of stimuli. Bark, in conjunction with the ammonia, may also be useful; or quinine, if it agrees better with the stomach. Though fluid nourishment only can be swallowed, we may still persuade the patient to take sufficient to sustain her; and the kind should be strong broths, jellies, dissolved isinglass, milk, arrow-root, and such preparations as contain a large proportion of digestible nutriment in a small bulk.

In bringing this subject before the notice of the junior members of the profession in this place, I am chiefly desirous of insisting on the propriety of their using every possible precaution to prevent the disease attacking a puerperal patient. With this view, should it break out in a family, the mother of which is within two or three months of her confinement, she should be immediately removed from home, out of the influence of the infected atmosphere; and not allowed to hold any *direct* intercourse with her children, until three or four weeks have passed over after her labour; although, in the mean time, they may appear to have recovered perfectly; for the infection in this dangerous disease is so subtle, and the length of time it hangs about the person of the convalescent patient is so variable, that no one can calculate upon the period when it may cease to spread. It might be supposed, indeed, that it would not be necessary to place the woman under this rigid restriction in regard to her children at such a distance as ten or twelve weeks from her expected confinement; nor perhaps would it, were we assured that she would pass to her full time; but the fatigue which she must undergo, and the exertion which we cannot prevent her voluntarily taking on herself, while her children are laid up by sickness under the same roof, together with the anxiety of mind she must experience, are very likely to induce labour prematurely; after which accident she would almost certainly fall under the malady; and the probable result may be gathered from what I have already advanced. My own experience would teach me that no language can be found too strong in which to convey a caution in this particular. I saw three women within a few months of each other, die speedily after labour from scarlatina, caught in this manner from their children, whose lives, we have reason to believe, might have been preserved, had they been separated from their families in proper time; and although some authors* assert that, to become the subject of scarlatina a second time during life is very rare; yet, as far as the puerperal woman is concerned, having previously gone through the disease offers to her apparently no protection. Some years ago the children of a patient of mine, the mother of a large family, between seven and eight months advanced in pregnancy, became the subjects of scarlet fever, and they all had it in a mild form; but so alarmed was I for her safety, that I advised her immediate removal from home; a house was taken for her accommodation, in which she was delivered, and I did not permit her to see one of her children until she was perfectly convalescent from her lying-in. I am persuaded that the precaution then used saved her from much danger; and in a similar case I should act again exactly in the same manner.

DISEASES OF PREGNANCY.

GENERAL MANAGEMENT OF A PREGNANT WOMAN.

So far as the general management of a pregnant woman is concerned, it is necessary that I should say but little, because it is not often that a medical man is consulted on this subject. However, if his opinion should be required in reference to the plan proper to adopt, such a one must be recommended as is likely to produce a healthy regularity in the functions of the body, and least liable to be attended by disturbance. She should avoid every cause of mental excitement, as well as personal fatigue, such as late hours, heated rooms, large assemblies, balls, and plays; for in the irritable state of the nervous system induced by pregnancy, slight causes will sometimes produce the most disastrous consequences: thus the mere mental agitation consequent on seeing a deep tragedy might be sufficient to produce abortion. Exercise should be enjoined, short of fatigue, just sufficient to keep the patient in a state of general health. Her food should be simple, and that which is likely to be most easily digested. A moderate quantity of fermented liquors, or wine, if she be accustomed to it, may be allowed.

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* Willan's Synopsis of Cutaneous Diseases, by Bateman, 1824, p. 71. Bateman, also, note same page. Tweedie, art. Scarlatina, Cyclop. of Pract. Medicine, p. 642. Watson, Med. Gaz. Sept. 9th, 1842, p. 901.

Most of the diseases of pregnancy are the consequence either of pressure, distention, inflammatory action, specific contagion, or a peculiar irritation attendant and dependent on the state of pregnancy.

SYMPTOMS DEPENDENT ON PRESSURE.

By pressure, costiveness is almost always induced, and all the various inconveniences consequent on that state. The sluggishness of the bowels mostly present under pregnancy, has been attributed, with some show of reason, to other causes besides mechanical pressure. It has been supposed that the nervous energy, being directed to the uterus with such activity, proportionably diminishes the sensitiveness of the intestines, and that therefore their functions are not performed with their natural vigour. Whether this explanation be correct or not, there is no doubt both that a torpor of the alimentary tube frequently accompanies gestation, and also that women are not in general sufficiently attentive to the due evacuation of the canal during the growth of the gravid womb. This omission is productive not only of much distress while pregnancy continues, but occasionally of great danger after labour is completed; for I am perfectly persuaded that the fatal diseases of the puerperal state have been in many instances excited by an over-loaded condition of the bowels.

Dyspepsia is a very frequent attendant upon pregnancy, with all its train of annoyances, acidity of stomach, flatulence, heartburn, palpitation, giddiness, and fainting. These symptoms are generally relieved by attention to the bowels. The acidity and consequent heartburn may be treated by magnesia, soda, or ammonia. It is not a dangerous symptom, but produces much distress. Palpitations are often very distressing, and occasionally dangerous. They occur most frequently in first pregnancies, and in irritable habits; are felt occasionally both by day and night, and are easily excited by mental agitation. Palpitation may produce abortion in those who are subject to a premature expulsion of the ovum; or rather it may be considered as a premonitory symptom of miscarriage about to take place. The treatment would consist in quieting and calming anxiety, and in soothing the nervous feelings. Laxatives, and the diffusive stimuli, may be administered, especially those which are considered antispasmodics, such as musk, ether, ammonia, camphor, valerian, and assafœtida. Opium is scarcely admissible.

Palpitations of the heart are most frequent during the latter months of pregnancy, whilst the uterus is pressing the diaphragm upwards. Syncope, on the contrary, is more often met with during the early months of gestation, and is sometimes very dangerous, especially to the child, since the fœtus is likely to die from the supply of blood to the uterus being suspended during the continuance of the faint: abortion is then consequent on the death of the ovum. Our treatment would be such as is commonly recommended under fainting—allowing the patient to breathe a cool air, placing her in the recumbent posture, applying volatile salts to the nose, dashing cold water on the face, and exhibiting a little sal volatile, some brandy and water, or other stimulating substances.

Local inconveniences are very frequently consequent on pressure. The patient experiences cramps in the thighs and calves of the legs, from pressure on the nerves; but these sensations are easily relieved by a change of posture, keeping the bowels free, and employing opiate liniments. Œdema often arises from pressure on the absorbents, and this may be relieved by rest and the horizontal posture. A varicose state of the veins is a very common consequence of pressure; this seldom appears in the first pregnancy, but oftener after a woman has borne a number of children. It is generally best relieved by a roller or laced stocking, by keeping the horizontal posture, and remaining at rest. Sometimes the veins in the leg will burst, immediate danger is induced, and a troublesome ulcer is eventually left. Death has happened suddenly from such an accident.*

Strangury from pressure on the bladder, and tenesmus from pressure on the rectum, sometimes occur in the early months of pregnancy. Piles are also troublesome during gestation, and are consequent on the pressure exerted upon the hæmorrhoidal veins. Jaundice is another result of pressure. This generally occurs during the latter months of pregnancy, when the enlarged uterus occupies a considerable portion of the abdominal cavity.

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* I was once called to see a patient in great hazard from the bursting of a varicose vein in the leg. Complete syncope had occurred, and she was found lying on the ground in her room, the floor of which was perfectly covered with blood. A neighbouring practitioner was sent for; and, as the woman was near her full time, and he could obtain no history of the case, he very naturally thought the hæmorrhage had proceeded from the womb. When I arrived, finding the os uteri open, and that labour had commenced, I was deceived also; especially as there was rather more sanguineous discharge from the uterus than natural. She was then recovering from the faint, and no means, beyond rupturing the membranes, were taken to hasten delivery; but it was not till she could give an account of the occurrence that any body around her had an idea the bleeding had proceeded from the leg. It appears to me, that both the varicose state of the veins and the piles, that are so often present towards the close of pregnancy, may be dependent not merely on simple pressure, but may be the result of the enlargement that is going on in the vascular system of the uterus itself.

SYMPTOMS DEPENDENT ON DISTENTION.

Pain in the abdominal muscles very frequently occurs, as a consequence of their distention. They are rigid in most first pregnancies, and do not give way easily to the increasing volume of the uterus. This pain is experienced in the fibres throughout their whole extent, but is particularly referred to their origins and insertions. It is a matter of the greatest consequence to distinguish between this pain and that of inflammation : nor is the diagnosis difficult;—here there are no febrile symptoms; in inflammation under pregnancy, the fever usually runs high. The pain from distention is not increased by pressure, but rather relieved by it, and also by friction;—the pain of inflammation is very much aggravated by the gentlest pressure even of the hand. Bleeding, in cases where the pain arises simply from distention, is of no avail whatever. I have known a patient bled day after day, under the idea that inflammation was present, but without more relief than immediately attended on the state of syncope. On the arterial system regaining its power, the pain returns as violently as before. We shall find this state of rigidity best removed by opiate liniments, warm and anodyne fomentations, or oily applications.

An opposite state to that of rigidity is met with in women who have had many children—viz. a preternaturally relaxed state of the abdominal parietes, by which the abdomen becomes pendulous, the fundus uteri falls forward, and the os uteri is thrown back, towards the sacrum. This is not a painful state, but is exceedingly inconvenient, because walking can only be accomplished with great difficulty; and even when at rest the feelings are uncomfortable. The best mode (indeed the only one) of relieving this state, is by a broad, inelastic belt carried around the person; or it may be strung round the shoulders, if the uterus be very large, and the inconvenience considerable. I need scarcely advert to the distress the bladder must experience, if this affection exist to any aggravated extent.

INFLAMMATORY ACTION,

Under pregnancy, runs on much more rapidly to its termination than perhaps at any other time, except soon after delivery. This may be accounted for by the fact that there is actually more than the average quantity of blood circulating in the body of a pregnant woman, and also from the blood itself containing a greater quantity of fibrine than under other circumstances. The chest is frequently affected with inflammatory action; pneumonia is continually occurring, and therefore a very troublesome cough is a common attendant on pregnancy. But some women seem constitutionally subject to a cough when pregnant, especially in the early weeks, without the presence either of inflammation or congestion; in such, therefore, it may be looked upon as symptomatic of their state. Much pain and distress are occasioned by the succussion of the frame in each paroxysm, and frequently the urine is forced out of the bladder involuntarily, so that a constant state of great discomfort is kept up. This troublesome symptom may often be relieved by aperients and mild opiates. It is popularly supposed that abortion is likely to be induced by the agitation into which the person is thrown by the violence of the fits; but my experience does not bear out such an opinion. In the more advanced stages, if a cough appears, it is seldom removed without the loss of blood. Both in the early and later months, a warm plaster applied to the chest, and also between the shoulders, will be serviceable.

It is worthy of remark, that inflammatory affections during gestation require for their subdual, as a general principle, the loss of a larger quantity of blood than the same kind of attacks under the ordinary state of system, and also that such patients bear the loss better. Thus, with regard to venesection, we are proportionably bold in our treatment.

Women are frequently bled merely because they are pregnant. This practice is founded on some old superstitious notions, and, I need not say, is likely to prove injurious, unless there be present symptoms of inflammation or general plethora.

In most cases of inflammation, or fever, abortion occurs before death takes place; so long, therefore, as this event can be averted, so long we may consider there is a chance of saving the patient: but if miscarriage happens while the symptoms continue unabated, we look upon that circumstance with great anxiety; because it is almost always the precursor of death.*

In phthisis the symptoms are often so much mitigated under pregnancy, as to lead to the delusive hope that the lungs were not structurally affected; but they return generally with redoubled violence after labour; and the probability is that the patient may never again rise from her bed. This suspension of the disease is, perhaps, owing to two causes: first, because the blood being determined to the uterus in such a large quantity, the lungs are proportionably relieved; and secondly, it seems to arise from a beneficent law of Nature, who has apparently ordained that, as a general rule, death shall not take place under pregnancy, since the fœtus then must perish also. I would have the student beware of allowing this truce to lull him into an erroneous expectation of eventual recovery, and induce him to give to the friends a favourable prognosis; on the contrary, if we were perfectly satisfied of the existence of tubercles, we should not be doing our duty did we not explain the great probability there is that the ravages of the disease will be aggravated after the completion of labour.

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* "Women abort because they are already in great danger; and this is aggravated by the abortion." Denman, chap. xv. sect. 4. "When a pregnant woman labours under a malady which is to end fatally before the completion of her gestation, it almost invariably happens that a short time, generally a day or two before her death the uterine action is established and the child born." Montgomery, Signs and Symptoms of Pregnancy, p. 26.

A state of general fever frequently accompanies early pregnancy, unconnected with inflammation in any organ. This is attended with heat of skin, particularly of the palms of the hands and plantar soles, which increases towards evening. The nights are passed in almost uninterrupted restlessness, until, when the morning dawns, a gentle perspiration appears, and the patient falls into a short and disturbed slumber. Before the usual time of rising the paroxysm has gone off, to return with the return of evening. It is astonishing how well the strength bears up against this almost entire absence of refreshing sleep, and how little the system seems to feel its want. For the mitigation of this annoyance, clearing the bowels, and exhibiting saline medicines and diaphoretics, with attention to diet (which necessary caution is often disregarded by pregnant women), will be all the treatment usually required.

SPECIFIC CONTAGION.

The eruptive contagious diseases seem aggravated in their symptoms under pregnancy: thus small-pox, measles, and scarlatina, put on a formidable appearance, though pregnant women, as before stated, do not seem so susceptible of the contagion as other persons. It is worthy of note, that if a woman becomes the subject of small-pox, or measles, during pregnancy, and recovers without aborting, the child, in after life, is protected against that particular disease: and the same observation also applies to hooping-cough: a circumstance proving that some great revolution is effected in the constitution of the fœtus, through the mother's system.

Should fluor albus, gonorrhœa, or syphilis appear during pregnancy, the treatment must be conducted on general principles. In syphilis, it is not advisable to salivate the mother to any extent, for the sake of the child. The disease should be kept under by small doses of mercury, and the cure should be effected by the same medicine exhibited both to the mother and child after delivery. Astringent injections, for the relief either of gonorrhœa or fluor albus, are scarcely admissible in the pregnant state.

ASCITES COMBINED WITH PREGNANCY.

Sometimes, though very seldom, ascites is combined with pregnancy; and it is not difficult to account for the rarity of this combination. On the one hand, it is a very unusual thing for dropsy of the peritoneum to originate during gestation; and on the other, when the abdominal cavity is more or less distended with water, the action of the fimbriated extremity of the fallopian tube must be so impeded by the effused fluid as to render it scarcely possible for it to apply itself to the outer surface of the ovary in such a way as to occasion the grasp necessary for the production of conception. It is desirable to delay tapping, if possible, till some time after labour; not because (as used to be supposed) the operation brings a greater amount of danger to the mother than common, but because it is generally followed by expulsive action, and the emptying of the uterus. If it were performed in the early months, the patient would be likely to abort and lose her child. There used to be a great prejudice against tapping in pregnancy; but a number of instances are on record where the operation has been performed with success. In the number of the Medical and Physical Journal for May, 1827, there is a case, by Mr. Russel, where this operation was undertaken successfully in the seventh month, and labour did not occur for more than a month afterwards; but this is unusual.

ANOMALOUS SYMPTOMS DEPENDENT ON PREGNANCY.

Women are often distressed with very troublesome anomalous symptoms consequent on gestation; and which, in many instances, are only to be removed by labour; but frequently the patient is relieved as soon as quickening takes place, or, at any rate, towards the latter part of her pregnancy. Of these annoyances toothache and facial neuralgia are the most common;—violent pain referred to one tooth, or perhaps to the whole of one side of the jaw, without the presence of caries; and salivation without the mercurial fœtor, or ulceration of the gums is sometimes met with. Other symptoms seem dependent on determination of blood to the head—such as pain, giddiness, partial or total loss of sight, apoplexy, or convulsions; these have been already noticed.

Another, and a very unpleasant symptom, is an undefined apprehension of danger resting on the woman's mind, producing despondency and a presentiment of death. Generally indeed, as well under pregnancy as during labour, an exemplary reliance and fortitude may be observed, the patient seldom repining, however great her sufferings may be; but it is well worthy of remark, that women who become strongly impressed during pregnancy, with the idea that they shall not survive, frequently do not recover well:—they either die after labour, or are subjected to illness, and are placed in a state of danger. There is nothing I am more concerned to hear, in conversation with a patient, than this inexplicable fear for the result of labour. Under this state, confidence should be instilled into the patient's mind, and the instances of her friends who have had large families, constantly brought, in a proper manner, before her notice.

I have already mentioned the morning sickness as a sign of pregnancy; and when this continues to any extent, it may be considered a disease. Medicine will be of little avail, as it is rejected as soon as swallowed. Local applications seem to me most likely to be beneficial; and of these, opium externally is the best. Dr. Hamilton recommends a cloth steeped in laudanum to be constantly kept to the stomach. Other physicians think that blistering is useful. If vascular excitement of the organ be present, both blistering and leeching would be indicated.

There is usually accompanying this affection, a constipated state of the bowels, and it is highly desirable, therefore, that they should be carefully attended to. An enema may be had recourse to; and of all medicine, that which is most likely to be retained on the stomach is the common effervescent draught, to which a small quantity of sulphate of magnesia may be added. If the sickness should continue after the bowels have been relieved, a few drops of tinctura opii, or three or four of diluted hydrocyanic acid, may be added to each dose. I have seen many cases where the combination of these medicines seemed to act as a charm, even when the symptoms had been most obstinate. I have also experienced great relief in this distressing malady, from champagne, which is generally not only an useful, but a grateful remedy. An opiate, enema, or suppository may be used, if other means have been found unavailing.

RETROVERSION OF THE UTERUS

Is rather to be considered an accident than a disease incidental to the pregnant state; and it is one of very serious consequence. It consists in the position of the organ being so changed that its fundus is thrown backwards, either against the promontory of the sacrum or down into the sacral cavity; while the mouth is canted upwards, behind or even above the symphysis pubis.*

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* Plate 86 shows the uterus retroverted. A, the fundus uteri. B, the mouth forced up against the pubes. C, the bladder distended.

History.—Whether, as Martin le Jeune[*] affirms, Hippocrates and Philumenus were acquainted with the nature of this displacement, does not appear very evident; but there is no doubt that Ætius, who was chiefly a compiler from previous authors, had some knowledge of it, for he describes it pretty accurately, and recommends that two fingers should be introduced into the rectum for the purpose of remedying it.[†] Both Mauriceau[‡] and La Motte[§] speak distinctly of the uterus in the early months of pregnancy occasioning a retention of urine, only to be relieved by the catheter; but the former ascribed it to a simple subsidence of the organ, while the latter, in giving a case of pregnancy of between five and six months, states that the difficulty was caused by the pressure of the head of the fœtus, though it appears the woman went afterwards to her full time; and it is impossible that the fœtal head could have occasioned such pressure under such circumstances. Daventer,[||] in his forty-seventh chapter, on one species of obliquity of the uterus, gives a tolerably good description of retroversion, when he says that the mouth of the womb cannot be touched at all, or only some part of the circle, and that will be felt close to the pubes; while towards the rectum a shut pouch is met with, and a substance that may be mistaken for the child's head. From Richter[¶] we learn that in 1732 a thesis was published at Dantzic, by J. A. Külm, bearing the title "Disputatio medica de uteri delapsu, suppressionis urinæ et subsecutæ mortis causa." The case which forms the basis of the pamphlet, happened in the preceding year to the wife of a soldier, four months advanced in pregnancy: she was suddenly seized with inability to pass urine, while carrying a heavy burden on her back, her foot having slipped. She died on the eighth day; and the dissection proved it to have been an instance of perfect retroversion. The bladder was described as being two feet in length and one in breadth, and containing the amazing quantity of twenty pounds of urine. In 1765, Walter Van Doeveren, professor of midwifery at Gröningen, published two fatal cases of this kind.[**] And Smellie tells us "he was called to a patient in the fifth month, and felt the fundus uteri forced down backwards to the lower part of the vagina, the os uteri being forward, and above the inside of the left groin."[††]

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[*] Memoires de Medicine et de Chirurgie pratique, 1835, p. 137.

[†] Tetrab. iv. cap. lxxvii. de reclinatione, avertione, ac recursu uteri, per J. Cornarium, latinè conscriptum. Lugd. Bat. 1659, p. 1004. This chapter is taken from Aspasia.

[‡] Livre i. chap. xv.

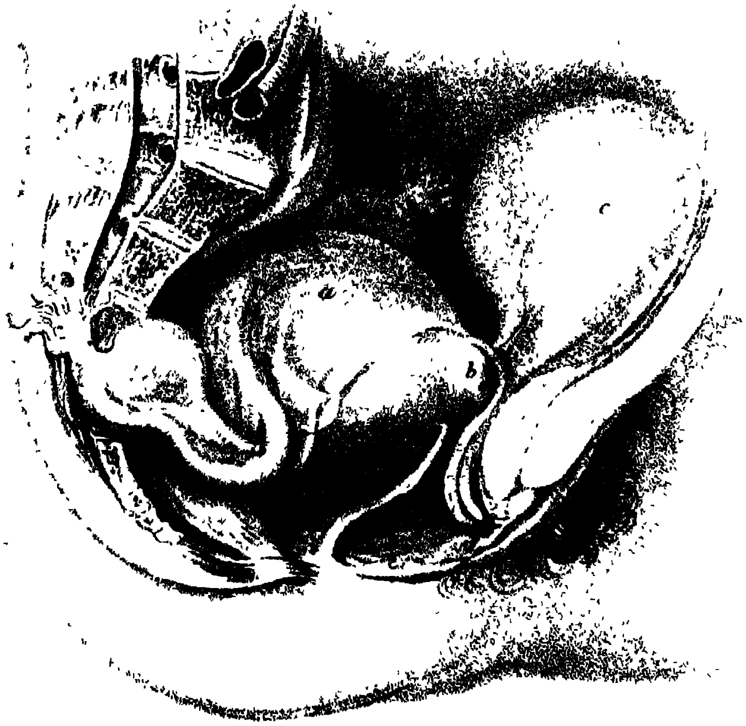
[§] Obs. xlii.

[||] Mid. improved. Engl. Transl. 1728, p. 263. The original was published in 1701.

[¶] Synopsis Praxis Medico-Obstetriciæ, 4to. Mosquæ, 1810, p. 73.

[**] Specimen Observation. Academ. ad monstrorum historiam, et artem obstet. præcipuè spectantium.

[††] Collect. x. Numb. 2, Case 2.


a
b
c

He gives another case* too, which though not so clear, must have been of the same kind, in which he was obliged to draw off the urine for eleven days; and he mentions having known many cases of difficulty in passing water at the end of the fourth month, which vanished at the end of the fifth.†

But it is to William Hunter that English surgeons are indebted for the first accurate account of this dangerous accident. He gave a full description of it in 1771;‡ and afterwards illustrated his demonstrations by drawings. This publication was the substance of a lecture he had delivered to some practitioners as well as students, so long previously as 1754, and was added as an appendix to a case of the same kind, in which the bladder burst, communicated to him by Mr. Lynn, surgeon, of Woodbridge. It appears that in 1754, Mr. Walter Wall was called to see a woman labouring under retention of urine, and difficulty in voiding fæces; presuming it to be a case of retroversion,—which he had heard described by M. Gregoire, at Paris, when he was attending his lectures,—after having emptied the bladder, he made an effort to reduce it, by passing one finger into the rectum and another into the vagina, as M. Gregoire had taught. In this he did not succeed; and observing the danger of the case, he requested Dr. Hunter to see the patient in consultation. Other unsuccessful attempts were then made to reduce it, and she eventually died of irritation or vesical inflammation. An accurate *post mortem* examination was instituted by Dr. Hunter; and drawings were taken of the state of the parts, which Dr. Hunter subsequently published in his delineations of the anatomy of the gravid uterus. He made the case very soon the subject of the lecture to which I have referred. From this account it is evident that M. Gregoire was the first to point out with exactness the nature of the accident, and to lay down a rational mode of treatment; and that Dr. Hunter, with the intelligence and alacrity of a great mind, devoted to the pursuit of science, and the relief of his fellow creatures, seized upon the opportunity afforded him by the dissection which he conducted, to make himself master of the case; and immediately communicated to his brethren in the profession the information which he himself had obtained. So that as M. Gregoire's remarks were never published, he may be said to have been the chief means of bringing this important subject to the knowledge of the profession at large. Smellie was also a pupil of Gregoire's, which may account for the notice he takes of retroverted uterus; but he certainly did not make so good a practical use of his preceptor's instructions as did Mr. Wall.

There is only one period of pregnancy at which this occurrence can take place—namely, just about the time when the uterus is rising out of the pelvis to become an abdominal viscus, its fundus peeping up above the brim; and this usually is between the third and fourth month; but it is in some degree regulated by the size the organ has acquired at this particular time; and also by the capacity of the pelvis itself.

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* Col. x. Case 1, Vol. 2nd.

[illegible]Vol. i. p. 120, 1779.

‡ Med. Obs. and Enquiries, vol. iv. p. 400.

There are two varieties of retroversion,—complete, when the fundus is thrown downwards and backwards into the cavity of the sacrum,—partial, when the organ lies across the short diameter of the brim, its fundus resting upon the promontory of that bone.

Cause.—The cause of this accident is most frequently, if not always, to be traced to an over-distended bladder; and the history of it is of this kind. The woman has been, from some circumstance, unable to pass her urine for a considerable time; she has probably been engaged in society, in a state of some restraint; and the bladder, therefore, has become more than ordinarily full. As the necks of the bladder and of the uterus are so intimately connected together by cellular substance, and as the bladder is so distensible a viscus that it will contain many pints of fluid, it must be evident that the more it is filled, and the higher it rises into the abdomen, the higher it also draws with it the uterine mouth. In this way the neck of the womb is raised upwards and forwards, and the fundus proportionably directed backwards, partly by the mouth being elevated, partly by the full bladder pressing against its anterior face. Under this state of things, if the woman's person be subjected to any sudden exertion, the abdominal muscles acting powerfully, compress the bladder, an impetus is propagated to the rising uterus, and the jerk causes the fundus to fall backwards and downwards. At the same time the ligaments must be more than usually lax to allow of the fundus being thrown into this unnatural situation. Not an uncommon source of retroversion may be found in the effort of jumping from the step of a carriage on returning from the theatre, or a round of morning visits; but even walking quickly across the room, or rising suddenly from a chair, has been known to produce it. In some instances, also, it has occurred very gradually.* One or more tumours attached to the back part of the fundus or body of the uterus will predispose it to fall backwards, and thus to induce complete retroversion; † should the bladder become distended, and any exciting cause be applied under such circumstances, the chance of this accident happening will be increased.

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* Baudelocque, parag. 254, transl. gives an instance.

† See a case by Ingleby, Edinb. Med. and Surg. Journal, vol. xliii. p. 145, Jan. 1835.

The patient seldom feels much inconvenience at the moment; she is sensible, perhaps, of a slight shock, but she is not aware that anything serious has happened, and her fears are not roused till, on endeavouring to evacuate the bladder, she finds that only a small quantity of urine, or perhaps not a drop, will pass, notwithstanding that she makes the greatest efforts she is capable of. The cause of the bladder not being able to expel its contents may be easily understood; either the urethra or the neck of the organ itself is pressed forcibly against the posterior part of the symphysis pubis by the os uteri, which is canted upwards and forwards, and thus a stricture, more or less complete, is produced by the relative change in the situation of the pelvic viscera. Thus the altered situation of the womb, the predisposing cause of which was originally most probably a distended bladder, becomes in its turn the cause of a distressing retention of urine.

It is generally believed that women who possess a preternaturally large pelvis are most liable to this formidable accident,[*] and an unusual size of the pelvis is therefore enumerated as one of the predisposing causes of retroversio uteri. I have already stated[†] that my own experience would teach me, that there is much greater chance of such an occurrence happening where the brim is slightly deformed, the conjugate diameter being somewhat below the standard dimensions; for if the sacral promontory dips too far forwards, whilst the cavity of that bone is of ordinary capacity, the fundus, as it rises, will impinge under the projecting shelf; and a disposition is thus given to the production of the misfortune now under consideration.[‡] It is certainly true that if the general dimensions be unusually great, there is more danger of retroversion occurring, than if they were of normal form and size; but no woman, whatever sized pelvis she may possess, is to be considered as exempt from such a liability.[§]

Termination.—If the bladder thus distended be not relieved artificially, it will burst, and the contents become extravasated into the cavity of the abdomen,—a fatal termination, as we have already learned;[||] or, what is perhaps more likely, a small quantity of urine being forced out mechanically, will dribble away involuntarily, through the urethra; and although immediate death does not occur, such a degree of irritation will be induced as to cause the patient to sink under her protracted sufferings. Inflammation of the bladder, indeed, is for the most part set up under these circumstances, and gangrene, or suppuration, is very likely to occur. I once opened the body of a pregnant woman, whose uterus was retroverted, in which case an aperture was made through all the coats of the bladder by the ulcerative process, and the fluid was effused into the peritoneal sac. The cause of the inability to expel the urine had not been discovered during life.

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[*] See a paper by Mr. Baynham, Ed, Med. Surg. Journ. vol. xxxiii. April, 1830, p. 256.

[†] Page 31.

[‡] "We are disposed, with Calisen, to rank among the inducing circumstances, a certain degree of narrowness of the pelvis, and especially, a considerable curvature of the sacrum backward, and great prominence of the sacro-vertebral angle." Boivin and Dugès on Diseases of the Uterus, p. 74. "The pelvis which is most capacious below and narrowest above will be most disposed to such disorders." W. Hunter, Med. Obs. and Enq. vol. v. p. 389.

[§] The narrower the conjugate diameter at the brim, the earlier in pregnancy will this accident occur, if it happens at all.

[||] Page 507.

Thus, then, if the bladder be not emptied, either laceration of that organ will take place, or such a degree of inflammation will be induced, as will most probably terminate in ulceration or gangrene, and eventually in death. The rectum will also be unable to expel its contents without much exertion and straining, in consequence of the pressure which the fundus uteri exerts on its lower portion; and a bearing-down pain will be complained of, as though a child's head were passing through the pelvis. The continuance of the uterus in this position will cause an accumulation of fæces in the colon; this accumulation will tend to press the uterus downwards more and more, and the straining effort, that the woman is constantly making, to procure relief from the bladder and rectum, will much aggravate the urgency of the symptoms, as well as the danger of the case, by adding to the difficulty of restoration.

If the woman lives, and the womb is not replaced,—the bladder being relieved by the catheter, and the bowels answering to the stimulus of purgative medicine,—it continues enlarging, and adds, by its increasing bulk, to the patient's distress; but, from being cramped up within the bony parietes of the pelvis, it cannot grow beyond a certain size; and when it has attained so great a bulk as to cause much pressure on the pelvic structures, the irritation generally occasions expulsive action; and probably the contents are eventually thrown off. Many instances have been known in which it has continued retroverted till between the sixth and seventh month of gestation, or even beyond that period, and relieved itself at last by expelling the ovum prematurely; and Dr. Merriman has detailed two cases in which it remained in this state of misplacement until the completion of the natural period of pregnancy.*

Symptoms.—The history I have already given will lead us easily to an acquaintance with the symptoms; the most prominent of which is a sudden inability to evacuate the bladder after it has not relieved itself for some hours. Sometimes the retention is complete, at others partial; and what small quantity of water does pass, is voided with great difficulty. Such an occurrence is so suspicious of this particular accident, that whenever we are consulted by a patient between three and five months advanced in pregnancy, who has found herself suddenly incapacitated from voiding her urine, the mind should be directed to the great probability of retroversion being the cause; provided, indeed, she had always passed it easily prior to making the last unsuccessful attempt. In proportion to the length of time that elapses after the retroversion has taken place, before means of relief are applied, will the urgency of the symptoms increase, until they become aggravated to a degree of almost insufferable anguish.

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* Dissertation on Retroversion of the Womb, 1810.

The pressure on the rectum will occasion a forcing downwards, and a false sensation of desire to empty the bowel. The tenesmus, however, will neither appear so instantaneously, nor will it be productive of so much distress as the retention of urine. There will be present, also, a dragging pain in the loins, in the iliac regions, and at the groins, from the stretching of the broad and round ligaments, and a general feeling of fulness, tightness, and impaction, within the pelvic cavity. Occasionally, though not often, the displacement is immediately attended with vomiting, faintness, frequent, weak, and irregular pulse, and such other symptoms as usually are present under strangulated hernia. Nor can we wonder that this should be the case, when we consider the violent shock that the occurrence might be expected to occasion in the system. We must rather feel astonishment that so little immediate disturbance commonly follows so grave a casualty; for not only must there be a considerable strain upon the ligaments,—not only must the altered position of the uterus and vagina produce unusual pressure on and distension of the pelvic viscera; but the fold of peritoneum passing from the upper part of the vagina to the rectum must be carried downwards and elongated by the weight of the descending womb. Yet one lady to whom a complete retroversion happened, as she was hurriedly getting out of bed in the morning, finding herself unable to pass any water from the bladder, instead of sending for medical assistance to her own residence, felt well enough to drive to my house to obtain relief.

The symptoms that I have detailed are in themselves, although very suspicious, by no means positively indicative of retroversion, because they may be produced by a simple subsidence of the uterus, by an enlarged ovary, or other pelvic tumour impacted in the cavity. But the case can generally be rendered perfectly clear by an examination per vaginam. Under this examination, a hard, apparently solid, round tumour, will be felt occupying the principal part of the pelvic cavity, external to the vaginal coats, and lying between that canal and the rectum; while the posterior wall of the vagina at its upper part is thrust forcibly forwards. The finger will be passed up to the brim of the pelvis with greater or less difficulty, and the os uteri, instead of occupying its natural situation, looking backwards to the cavity of the sacrum, will be discovered turned upwards and forwards behind, and sometimes even above the symphysis pubis. Whenever this situation of the os uteri can be positively detected, no doubt can remain that the womb is misplaced; and if the woman be persuaded she is pregnant, and about three months and a half or four months advanced, our judgment as to the true nature of the case will be materially strengthened.*

If the uterus continues retroverted, the symptoms that successively arise will be those of irritation and pressure; there will generally be a total inability to evacuate the bladder at will, while at the same time some urine will be constantly dribbling away involuntarily, frequent and ineffectual attempts to pass fæces, a sensation of forcing in the neighbourhood of the anus, aggravated occasionally by spasms of the abdominal muscles, but particularly of those within the pelvis; and should inflammation supervene, others will appear in addition, which will very much increase the poor patient's distress. There will be constant pain in the hypogastric region, irregular rigors, quick pulse, a loaded tongue, restlessness, dry heat of surface, more or less of headache, a haggard, pinched, and *patchy* countenance, total want of sleep, except under the influence of opiates, vomiting at first of healthy secretions, afterwards of offensive matter, and other indications of irritative fever. Added to which, should the inflammatory disease attack the bladder, the urine, when drawn off, will deposit a copious muco-purulent secretion; blood will sometimes pass with it, and the tongue, with the lining membrane of the mouth, will become aphthous. Under these combined sufferings the patient will too often sink.

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* I would refer to my father's 143rd case, second edition (the 211th of the first), for an interesting example, simulating retroversion of the uterus, where two celebrated obstetrical physicians were deceived in regard to the existence of this affection, and where many attempts were made to push what was supposed to be the retroverted womb above the pelvic brim. On examination after death, the left ovarium, in a dropsical state, was found filling a large portion of the abdominal cavity; the right, also dropsical, was bound down by adhesions to the pelvis, and the uterus lay horizontally between the two, its mouth canted up against the symphysis pubis. The right was mistaken for the body and fundus of the impregnated uterus; and it certainly bore a great similitude to the uterus, when the finger was pressed against it. I watched the case from the time my father first saw it till the woman's death; he doubted the existence of pregnancy, being able to feel the os uteri, and finding it did not offer the characteristics of the impregnated state; but he was overruled by the gentlemen called in consultation, neither of whom had any doubt upon the subject. See also a case in which a tumour in the pelvis, probably ovarian, was mistaken by Mad. Boivin and Professors Dubois and Béclard for a retroverted uterus. (Boivin and Dugés on the Diseases of the Uterus, translated by Heming, p. 79); and another, in the Bulletin de la Faculté de Médicine, 1812, where the tumour was punctured by Jourel, under the same mistake.

Treatment.—Our first duty,—that which is most imperative and pressing,—consists in emptying the bladder, by introducing the catheter. This simple operation it will sometimes not be easy to effect: it is not always possible to distinguish the meatus urinarius by the finger, in consequence of its being drawn farther within the vulva than its natural situation, by the ascent of the bladder, and the alteration in the relative situation which the pelvic viscera bear to each other. Another probable cause of failure will be found in the difficulty with which the instrument passes through the constricted portion of the urethra; and a third, perhaps, by that canal being twisted somewhat to one side, as happened in the case related by Dr. Ingleby;* and which cause of difficulty I have myself experienced. Should such obstacles to its ready entrance into the bladder oppose themselves, it is infinitely better to guide it by the eye, than to leave the case in the hope of being more successful in a few hours; because the symptoms are urgent, and the danger is imminent; and because the loss of but a short time may place the patient irrevocably beyond the reach of art. Rather a longer catheter than common should be used for the withdrawal of the water under such circumstances, because the urethra is often considerably stretched by the bladder rising high into the cavity of the abdomen; and probably a male flexible instrument will answer the purpose best.

As the introduction of the female catheter is an operation frequently required in the ordinary routine of practice; and as it is particularly requisite in the case now under consideration, I trust it may not be considered out of place, if I digress to give some more particular instructions here.

For the relief of the bladder under ordinary circumstances, we shall find the common, round catheter answer our purpose, perfectly well; but in many cases, especially under labour, the flat instrument will be preferable; if it possess a telescope slide, it may be fitted into a case, but little larger than a pocket pencil.

To preserve the bed dry, we may either tie a pig's bladder, (which from its thinness is preferable to that of any other animal), having perfectly emptied it of air, to the end of our catheter, or we may cause to be placed under the hips, a sheet three or four times doubled; and we shall then require, besides a common chamber utensil, a smaller vessel, such as a pint basin, into which the urine may be directly received.

It is generally recommended that the patient should lie upon her back, lightly covered; and that the attendant should stand on her right side, place the left hand upon the vulva, separate the labia externa with the two first fingers, and pass the fore-finger within the genital fissure, immediately upon the clitoris; which can in most cases be easily distinguished by its small, rounded figure. Sliding the finger, then, downwards and inwards along the smooth groove, about an inch in extent,—*the vestibule,*—but which might with propriety be named the *iter ad meatum urinarium*, it encounters at the extremity, the orifice itself; and this is recognised by its presenting a somewhat prominent ring, which possesses a central aperture. Keeping the point of his finger directly upon it, he is to desire the patient to raise her right knee; and holding the catheter lightly between the thumb and second finger of his right hand, he carries it under her elevated ham, and insinuates its extremity, guided by the fore-finger of the left hand, into the meatus; depressing then its outer end, it slips up without any force being required, into the cavity of the bladder.

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* Edinb. Med. Surg. Journal, vol. xliii. p. 145.

I need scarcely remark, that, as in labour, the instrument should be smeared with some unctuous substance, and that we should take means to assure ourselves it is not plugged, the lateral holes being quite pervious; and it is almost equally unnecessary to advise, that unless the catheter be armed with a bladder, the open extremity should be guarded by the fore-finger of the right hand placed against it, until its full introduction, and till the vessel is ready to receive the urine. All this, if properly managed, can be accomplished without uncovering the patient, in the least degree, and, in reality, is not so indelicate a proceeding as the description would lead us to expect.

This is the method usually recommended and followed; but for myself, I much prefer that the patient should lie on her left side, near the edge of the bed, with her person placed rather across it, and the thighs slightly bent up towards the abdomen. In this position, when a little tact is acquired, the meatus urinarius can as easily be discovered, as when she lies upon her back, the catheter passes with even less difficulty along the urethra, the operation has less appearance of indelicacy about it, and there is less chance of the urine being spilled upon the bed. Indeed a flexible male catheter may be used, of sufficient length to reach beyond the bed-furniture, and the contents of the bladder can be received at once into a wash-hand-basin. It will be seen that, in my remarks on the management of women under lingering labour, I have recommended, if the catheter be necessary, that the patient should not be moved from her position on the left side.*

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* Page 261.

Independently of the accidental chances that I have already noticed, as embarrassing us in our attempt to introduce the instrument, sometimes a deep lacuna, situated in the vicinity of the meatus, may tend to deceive us into the belief that we have entered the urethra. The catheter will then, of course, meet with instantaneous obstruction, which of itself will be sufficient to awaken our suspicions; and an ocular inspection cannot fail to assure us of our mistake.

It is most probable, if the accident be recent,—especially if the retroversion be only partial,—that emptying the bladder alone, without any other means being used beyond preserving a state of perfect rest, will be sufficient to effect the return of the uterus to its normal position. The pressure of the distended bladder against its anterior face, which had held it down, being removed, a gradual restoration is brought about by the resiliency inherent in it; and the danger that hovered around the patient is entirely averted. But such good fortune may not attend our endeavours; the uterus may remain retroverted, and the difficulty in the natural evacuation of the bladder may continue. Under such circumstances, it is necessary that the urine should be drawn off soon again, and the operation repeated frequently. It is not requisite that the catheter be kept constantly within the bladder, but more than six, or at the farthest eight hours, ought not in any case to be allowed to elapse between the periods at which the instrument is used. The object is to preserve the bladder in as empty and contracted a state as possible, that it may offer no impediment to the fundus and body of the uterus, in its gradual ascent and restoration. Should, however, this restoration not occur within a limited time, we must resort to other means to accomplish it. It is generally recommended, then, that in thirty-six or forty-eight hours after the accident, the patient resting on her elbows and knees, the surgeon placing himself behind her, two fingers of the left hand should be introduced carefully into the rectum, and steady pressure upwards applied to the fundus of the uterus, occupying the cavity of the sacrum, while at the same time the first finger of the right hand should be as carefully passed just within its mouth, and some traction, in the most gentle manner, made downwards; it is supposed that by this double effort the organ may generally be reduced to its natural position. This mode of operating is advised, because it is believed that the power of gravitation will assist in restoring the fundus uteri to its proper situation; and no objection can be offered to it except its inconvenience and indelicacy. If, however, the posture above described were absolutely necessary, or possessed any great superiority over every other, even these disadvantages would carry with them little weight; but in my opinion this is by no means the case, for in every instance except two where I have thought it necessary to use manual efforts for the purpose of reducing a retroverted uterus, I have succeeded by the introduction of the fingers into the rectum and vagina, as just recommended, while the patient was lying on her left side, in the common obstetric position; and in the cases where I was disappointed, I failed also even when she was placed on her elbows and knees.*

In thus acting, however, we must use the utmost caution, both lest we should bruise the fundus of the uterus by the two fingers passed into the rectum, and also lest we should injure its mouth or neck, or produce such a degree of irritation as would cause expulsive action; for the fœtus must be preserved if possible. But let us suppose we have made this attempt, and used as much exertion as we think ourselves warranted in doing, unsuccessfully; how shall we then proceed? We must contrive to keep the bladder as empty as we can, relieve the rectum by enemata, and we may renew our manual efforts at restoration in twelve or eighteen hours. We may even repeat them daily for three or four days with proper care; for it is very possible that by perseverance we may succeed, although in the first instance we failed: and if success attend our efforts we must keep the patient in a state of rest,—indeed, in bed,—for at least a week after the replacement has been effected.

Still, however, the uterus may resist our attempts at reduction; and our next consideration will be, whether we shall take steps to empty it, so that, by the diminution in size which will necessarily follow the expulsion of its contents, we may facilitate its return to its proper situation; or whether we shall allow gestation to proceed, merely keeping a watchful eye over the case, and regularly relieving the rectum and the bladder. Our management must depend entirely on the symptoms manifested in each case. If the patient be not in present danger, if there is no great irritation existing in the system, no inflammation set up within the pelvis, no mischief as a consequence of the pressure sustained; if she can evacuate the rectum, and the urine can be drawn without trouble, there can be no necessity for any further steps to be taken immediately. We may even hope that as the uterus enlarges in growth, it may free itself from the unfortunate position; and I ground this opinion on a case that occurred to me in the year 1835, in which, although the organ was completely retroverted, and both my father and myself made repeated attempts to restore it, and failed in doing so, as there appeared no symptoms dangerous to the woman's life, I contented myself with confining her strictly to bed, and keeping the bladder and rectum unloaded; and previously to the termination of the seventh month the fundus uteri had spontaneously risen into the abdomen. The pressure being then removed, the bladder was again capable of performing its healthy functions. The patient went to her full time, and bore a living child. But, on the contrary, if symptoms of high irritation, or local inflammation, should occur, such as to bring the woman's life into immediate peril; if these symptoms are referable, as most likely they will be, to the malposition of the womb, we should then be fully warranted in inducing premature labour, in the hope that that step may ultimately rescue her from otherwise inevitable destruction. Nor will the object be generally very difficult to effect. Certainly, as the os uteri is turned forwards, and placed at such a height in the pelvis, it will not be so easy to puncture the ovular membranes as when it occupies its natural situation; but a curved metallic, or flexible gum instrument, may almost always be introduced, so as to produce the required effect. Should the os uteri, however, be out of our reach, or should we, from any other cause, be unable to break the membranes, for the purpose of letting off the liquor amnii, and diminishing the bulk of the womb, it *may* be necessary to make a puncture through its parietes with a trochar; and this operation, suggested by Dr. William Hunter, in the paper already referred to, has once, at least, in this country, been performed by Mr. Baynham, with a successful result.* If emptying the uterus seemed absolutely required for the preservation of the patient, and it could be perfected by no other means, I would not hesitate to have recourse to the trochar,—not, however, until I had made many efforts to destroy the integrity of the ovum, by the introduction of an instrument through the os uteri. I should think this means far preferable to puncturing the bladder, as was done by Dr. Cheston in his celebrated case;† and I should strongly object to a sound being passed into the urethra, or bladder, in any case, to act as a lever upon the os uteri, so as to press it down, while the fundus is being raised,—as suggested by Bellanger and Lallemand, and spoken of by Boivin and Dugés ‡ with praise,—because of the palpable chance of injury to those organs or to the uterus itself.

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* Mr. Baynham, in the paper referred to at page 651, thinks no advantage can be gained by placing the patient on her elbows and knees; and that the influence of gravitation cannot be relied on. Boivin and Dugés also think the posture on the elbows and knees inconvenient. (Diseases of the Uterus, p. 83, trans.)

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* Edinb. Med. Surg. Journal, vol. xxxiii. p. 256, April, 1830. In this case the uterus was tapped through the rectum; but Mr. Baynham very judiciously would prefer puncturing through the vagina, did circumstances render it equally eligible. See Bulletin de la Faculté de Médecine de Paris, No. viii. for an instance in which the uterus (as supposed) was punctured through the vagina, by M. Jourel, of Rouen, and the woman recovered; some doubts may be allowed as to whether this was a case of pregnancy complicated with retroversion.

† Med. Communications, vol. ii. p. 9, 1790.

‡ Op. cit. p. 83.

Dewees* had the greatest confidence in bleeding, which he carried to faintness, and which is also recommended by Boivin, before attempting reduction. I do not think bleeding, in the generality of cases, likely to avail us anything; because the difficulty in restoring the uterus does not depend on spasm, but on impaction, and other causes, which bleeding cannot remove. Besides, in all the cases that I have seen where it was necessary to make much effort, the patients have been too much reduced by the continuance of the retroversion to bear the loss of blood with impunity. I am willing to confess that, at the commencement of inflammation of the bladder or other organs, bleeding may suspend the disease, and may relieve, for a time at least, the tension; and thus by diminishing the bulk, perhaps, of the part to be returned, may render its restoration more easy; but its efficacy in assisting us to reduce a recent case, and employed as Dewees proposes, is in my opinion very equivocal.†

Although we cannot be surprised that on the reduction of the uterus, if the case be recent, the inability to pass urine, and other alarming symptoms hitherto present, should so instantaneously disappear, since they were the effect of mechanical pressure now removed; yet it cannot fail to strike us with admiration that others of a dangerous kind do not supervene, when we consider the violence to which the structures within the pelvis must have been subjected. To say nothing of the injury likely to have accrued to the rectum, bladder, and uterus itself, and to the peritoneum passing from the vagina to the rectum, which must have sustained great pressure, and have been strained exceedingly, the cellular substance between these organs must also have been compressed, contused, and probably torn.‡ We should expect not only inflammation, but suppuration, or gangrene, to follow. Such sad consequences, however, have not occurred in any of the cases which I have seen; and if ever they have happened, they have been attributable to long-continued impaction.

A most interesting case of recovery from the effects of a retroverted uterus is detailed by my father;§ and as I witnessed its progress I will shortly relate it. The lady before she came under his notice had been under the care of a gentleman who had apparently overlooked the nature of the case. When my father saw her, she was suffering most severely from an enormously distended bladder, and was instantly relieved from her agony on the introduction of the catheter. My father learned that she had not passed urine voluntarily for a fortnight, but there had been a dribbling more or less constant. Her previous attendant had been satisfied with the report of the nurse, that "her mistress passed her water." This inability had arisen suddenly, and she was between three and four months advanced in pregnancy. The history was sufficient to impress upon the mind a strong suspicion of the true nature of the case; and my father, on an examination per vaginam, satisfied himself that the womb was retroverted. He made attempts to replace it, and did not succeed. As I had attended the lady for him once in labour he called me to his assistance. The same attempts were repeated both by my father and myself, on many occasions, with equally bad success. The case in a few days assuming a most formidable appearance, we requested a consultation with an eminent physician practising the obstetric branch of medicine, which was granted; and it was on that occasion determined, that unless premature labour was induced, death must speedily ensue. My father succeeded in passing a curved bougie through the os uteri; and in about thirty-six hours he was summoned in a hurried manner, and found the fœtus expelled, the placenta in the vagina, and the uterus in its proper position. The patient continued in imminent danger for many weeks, in consequence of the distension the bladder had suffered; and large quantities of muco-purulent fluid, sometimes mixed with blood, passed daily with the urine. She ultimately recovered; and it is worthy of remark, that about the same period in her next pregnancy the uterus became again displaced in a similar manner.* My father was immediately apprised of it; and by keeping the bladder in an empty state, it restored itself without any other means being used. I had ascertained, when I attended her previously in labour, that her pelvis was below the average standard, not measuring more than three and a half inches in the conjugate diameter at the brim.

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* System of Mid. par. 202, *et seq.*

† I would beg to refer my reader to eight cases of retroversion of the uterus, which I published in the Medical Gazette and Times for October 23, 1852, p. 408, which go far to prove the truth of the position laid down by Denman, in opposition to the doctrine inculcated by Wm. Hunter, Baudelocque, Dennis, and others, that if the bladder be kept duly empty, the womb will, in the great majority of instances, regain spontaneously its natural position, without the employment of any manual operation beyond the frequent introduction of the catheter; and that even where strenuous and repeated attempts had been made, unsuccessfully, to replace it, it has restored itself, during the progress of its growth, in a surprising and almost incredible manner, as is indeed verified by the case related in the text.

‡ See plate 86.

§ Pract. Obs. in Mid. 2nd edit. case 163; or case 209 of the former edit.

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* Meigs (Treatise on Obstet. p. 258) details an instance in which retroversion of the uterus occurred in two succeeding pregnancies, at the same period.

EXTRA-UTERINE FŒTATION.

Occasionally, though fortunately very rarely, the ovum, after impregnation, does not reach the uterus, but remains either embedded in the ovary, or the fallopian tube, or falls into the general cavity of the abdomen. Being endowed with life, it attaches itself to that portion of the mother's body, wherever it may happen to have lodged, and a communication by vessels is reciprocally effected between the maternal structures and itself. By means of these vessels it is nourished, an imperfect placenta is formed,* and its increase progresses in as regular, and almost as rapid a manner, as though it had been received into the cavity of the uterus itself. It has been stated by Coste † that of all animals woman is alone subject to this irregularity; but this is certainly erroneous, for it has been known to occur frequently in the brute creation, Instances of it have been observed in the cow, sheep, bitch, and hare, ‡ besides others.

Extra-uterine pregnancy may be divided into four varieties: ovarian, tubal, abdominal, and parietal, or interstitial.

I. By *ovarian*, we mean where the fimbriated extremity of the fallopian tube has embraced the ovarium, and has impregnated the ovule, without having detached it from its bed. It becomes adherent to the gland by vascular connexions, takes on itself a process of growth, and the ovarium is converted into a sac, containing the newly-organised being.§

II. By *tubal*, we mean those cases where the fimbriated extremity of the fallopian tube has seized the ovarium, has detached an ovulum and impregnated it, but where it has been arrested in its transit through the tube, has formed adhesions to the inner surface of the tube itself, and has there become developed and grown.

III. By *abdominal* we understand where the fimbriated extremity of the fallopian tube has seized upon the ovarium, has impregnated an ovule, but not retaining it within its grasp, has allowed it to fall into the general peritoneal cavity.

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* The placenta is usually much more extended in surface than one formed within the uterus, and also thinner in substance. The funis appears natural in structure; and is generally of an average length.

† Embryogénie Comparée, vol. i. p. 383.

‡ See Campbell's Memoir on Extra-uterine Pregnancy, Edinb. 1840; a publication full of most valuable facts and deep research, and which I would strongly recommend to the perusal of those who take an interest in this subject.

§ Plate 87 shows a fœtus of between three and four months age embedded in the ovarium, where the ovule was impregnated. The patient died of hæmorrhage from the bursting of the cyst, and the preparation is in the London Hospital Museum. The drawing is two-thirds the natural size.

IV. By *interstitial*, or, as I prefer to designate it, *parietal*, is meant where the ovule, after having been impregnated, has passed through the fallopian tube, until it has arrived at that portion of the canal which traverses the substance of the uterus, and has there become embedded. A sac is consequently formed *in the uterine parietes*, occasioned by the growing ovum which lies within it; and this sac distends as the living being it contains increases; so that the ovum is shut up in a cavity formed within the uterine walls: and the uterus seems divided into two portions, the one containing its true cavity, the other this adventitious sac in which the fœtus lies.

Although in the works of Albucasis[*] may be found the history of an extra-uterine fœtus, which was evacuated through the umbilicus by ulceration, the occurrence was by no means understood till comparatively recent times,[†] and very few years have elapsed since the last variety,—the parietal,—has been known to exist. I believe we are indebted to Schmitt, of Vienna, for the first detailed account of this particular species, published in the first volume of the Memoirs of the Josephine Academy.[‡] Carus, of Dresden,[§] has given the drawing of a case which is reported by Hendrich;[||] and Breschet has published a most admirable description of this species in the first volume of the "Répertoire d'Anatomie et de Physiologie." He names it "*graviditas in substantia uteri.*"[¶]

In the year 1820 I opened the body of a woman who died from the rupture of a cyst of this kind. My father was called to her just before her death, and found her suffering under symptoms of internal hæmorrhage with the most violent abdominal pain. On dissection, we discovered between five and six pounds of blood, partly fluid and partly coagulated, effused into the peritoneal cavity, occasioned by a rent in the cyst, formed within the walls of the uterus to the left side. In the midst of this blood lay a fœtus of about five months age, inclosed within its membranes, and floating in the liquor amnii. The principal part of the placenta was still attached within the cyst, which was large enough to contain a common-sized apple; though it was evident that it had contracted considerably after the rupture had taken place. The cyst was globular in shape, and appeared like an off-shoot from the side of the uterus, being connected with it throughout nearly the whole extent of its edge. The uterus, distinct from the cyst, though closely amalgamated with it, was about twice its natural size, and if the cyst had been removed, nearly of its natural pyriform shape; the parietes were more flaccid than in the unimpregnated state; the true cavity contained a perfectly-formed deciduous membrane, and the mouth and neck were plugged with the gelatinous mucus secreted during the early weeks of pregnancy. There was no communication between the true uterine cavity and the cyst in which the ovum had lodged; and the walls of the cyst were nearly equal in thickness to those of the uterus itself. They perfectly resembled the uterine structure; for they were, in fact, a part of the uterine substance. Both the fallopian tubes and ovaries were perfectly healthy. One tube was attached to the cyst, and the other to the uterus on the opposite side; in the ovary belonging to the cyst there was a very well developed *corpus luteum.* As I was not at that time aware of the possibility of *parietal* pregnancy occurring, I was much at a loss to account for this case; and I showed the preparation to many good anatomists, who were as much puzzled as myself. By some it was looked upon as a case of double uterus, the impregnated chamber not possessing a mouth communicating with the vagina. However, thinking I might in time discover something more about it, I put it into spirits,* and I remained perfectly in the dark as to its true nature, until the year 1824, when I was requested by an eminent physician to assist him in translating a paper in the French language relating to obstetric science which he had received from Breschet, to be forwarded to the Medico-Chirurgical Society. It was a case of death from parietal extra-uterine pregnancy, and the account of the dissection contained so perfect a description of the appearances shown in my preparation, that I immediately recognised the identity of the two cases. This was indeed the first instance of the kind published either in France or England; it was read in February, 1824, and may be found, with an illustrative plate, in the thirteenth volume of that learned society's Transactions.* Breschet, after speaking of the cases which had been put on record by Schmitt and Hendrich, mentions that the late Dr. Albers, of Bremen, just before his death, communicated. to him the particulars of a similar case, which he intended to transmit to the Medico-Chirurgical Society; but this never was received.

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[*] Lib. ii. sect. lxxvi.

[†] In Bauhine's Latin translation of Rousset, 1601, p. 294, there is a very good history of a fœtus that had remained within the abdomen twenty-eight years, and had become converted into an earthy mass. The woman died in May 1582, æt. sixty-eight. The fœtus is reported as having been found *within the uterus;* though it was evidently *extra-uterine.* She had never borne a child.

[‡] Vienna. Anno 1801.

[§] Zur Lehre von Schwangerschaft und Geburt, Phys. Pathol. und Therapeut. Abhandlungen, &c. Leipzig, 1822.

[||] Archiv. für Medizinische Erfahrung, by Horn, Nasse, &c. 1817. This plate is copied by Granville in his illustrations of abortion, plate 10, fig. 1.

[¶] Dr. A. G. Carus, in a paper in the 15th vol. of Busch's Neue Zeitschrift für Geburtskunde, Berlin, 1844, p. 161, has collected the histories of fifteen cases of parietal extra-uterine pregnancy. This paper is an extension of his inaugural thesis, published at Leipsic in 1841, in which nine were given; six he has added since that date. These are all, I believe, hitherto on record, with the exception of the two related in the text, of the first of which I made a slight mention in my lecture, published in the Medical Gazette for May 16, 1835; one detailed by Dr. Oldham, in Guy's Hospital Reports, Oct. 1845; and another reported by Dr. Payn, surgeon to the Hôtel Dieu, at Aix, in the Revue Médicale, 1847.

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* This preparation is now in the London Hospital Museum; but having been taken from the body hurriedly, and at great disadvantage, it does not display the peculiarities of this case so well as Breschet's plate, which I have chosen for the illustration of the subject.

Another case of this description has come under my notice quite recently; and I shall detail it at length, because there are so few of this variety of extra-uterine fœtation on record.

Maria M., æt. 25, became an out-patient at the London Hospital under my care in the month of March in this year. She was married nearly four years ago, till which time she enjoyed good health; she miscarried soon after marriage, and in a few months she again supposed herself pregnant. She experienced all the symptoms of pregnancy; her breasts were fuller; she enlarged in the abdomen, was sensible of the movements of her child, which were strong and caused her great suffering; and rather more than two years and a-half since she was seized with pains like those of labour. She had ceased to feel the child three weeks before the accession of these pains. At this time a neighbouring practitioner was called, who, believing her in labour, remained in attendance for forty-eight hours. During the whole of this period, the pains were regular and strong; and a sanguineous discharge, in which there were some solid shreddy matters, came away; the pains gradually became weaker and less frequent, and at last passed off altogether. The discharge, however, continued for a month, and disappeared in a manner similar to the *lochia*, and she had a copious secretion of milk in the mammæ. She remained subject to violent occasional attacks of pain in the region of the uterus for five or six months; the abdomen decreased in size; and she became weaker and thinner. She was, however, able to get about, in time; suffered less; and considered herself better until last November, when she had an attack of what was called rheumatism. This illness confined her to her bed again for a few weeks; she was, however, able to leave town for the neighbourhood of Northfleet; and the medical man whom she there consulted recommended her, on her return to London, to obtain an out-patient's ticket for the hospital, and place herself under my care. When I first saw her, she was a good deal attenuated, had a cachectic appearance, and was evidently in very bad health. The pulse was frequent and small, the appetite was bad, the tongue loaded; the bowels were generally relaxed, and she had a considerable leucorrhœal discharge. There was a hard, very painful tumour on the right side of the linea alba, reaching from the pelvic brim upwards above the umbilicus, which prevented her lying on her left side. On examination per vaginam the os uteri was found to be quite natural in character; but the uterus itself was considerably enlarged, and felt as though it were tuberculated. As she had of late been gradually getting worse, I admitted her into the Hospital on July 10th. From that time she never left her bed; the bowels continued very much relaxed; a large quantity of offensive putrid matter, which was the flesh of the fœtus in a broken-down, semifluid condition, was voided *per anum;* a little purulent discharge flowed constantly from the vagina; she became very much emaciated, and died exhausted on August 11th.

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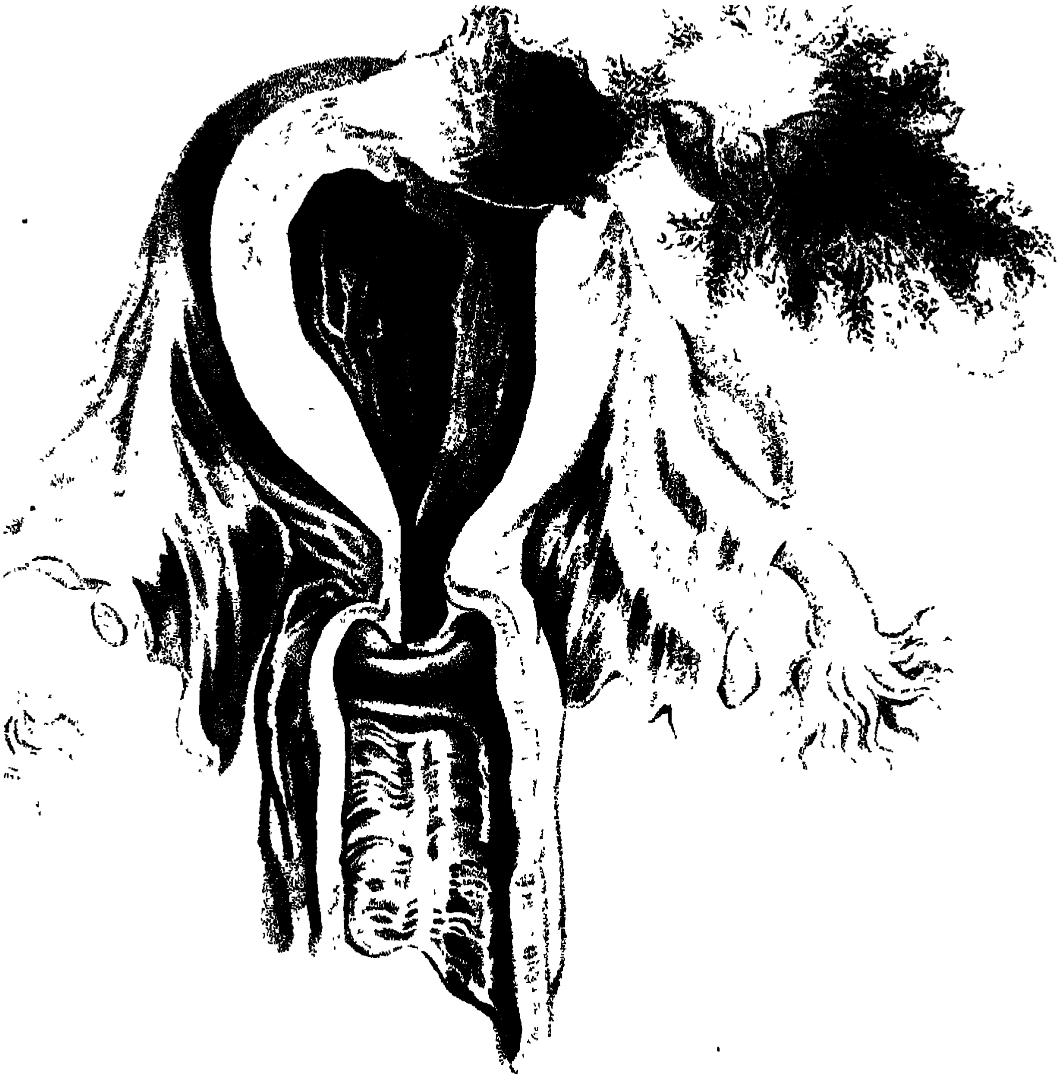
* Plate 88 gives a good delineation of this variety of extra-uterine gestation, of which the chief features are copied from Breschet's plate. A, the uterus; B, the cavity in the uterine parietes, from which C the ovum has escaped. The ovum is seen surrounded by the filamentous vessels, intended to form the placenta.

The following appearances presented themselves on *post mortem* inspection. The transverse colon was drawn down below the umbilicus, and was adherent to the fundus uteri. On separating the two from each other, a ragged aperture larger than a crown piece was discovered in the coats of the colon, communicating with a cyst in the parietes of the uterus, the result of ulceration. This cyst, nearly the size of two hands doubled one over the other, was pretty uniform in its surface, and contained apparently the whole of the bones of a fœtus, nearly at full time, detached from each other, the soft parts having entirely disappeared. A portion of one of the long bones protruded from the cyst into the cavity of the colon. Another communication, of a smaller size, also existed between the cyst in the uterine parietes and the rectum. The bladder was perfectly natural. On examining the parts, after their removal from the body, the vagina was found to be quite natural; the os uteri quite healthy, of the shape and dimensions it possesses in its unimpregnated state. The left half of the uterus was natural in structure, though turned laterally downwards, as I shall presently describe. Neither the left ovary nor the fimbriated extremity of the left fallopian tube could be found, being lost in adhesions with the anterior face of the rectum; but a portion of the broad ligament on that side, connected with the uterus, could be easily traced. The whole of the right side, and towards the fundus of the uterus, was occupied by the cyst containing the fœtal bones; the right ovary was only about half its natural size; and there was no appearance even of the remains of a *corpus luteum;* the fimbriæ of the right fallopian tube floated unattached. On tracing the uterine cavity, it was observed to be turned to the left side of the body at a complete right angle, the bend being situated at the upper part of the cervix; so that the fundus uteri pointed straight to the left *fossa iliaca,* being pressed



down no doubt by the cyst that occupied the right side of the uterine walls. The cavity of the uterus was about its natural size and shape (except for the bend), empty, and the inner membrane was quite healthy. There was no communication between the uterine cavity and the cavity of the cyst.

One extraordinary feature in this case is, that the uterine walls should have allowed themselves to be distended, or rather developed, by the growing ovum to such an extent as that the cyst should be able to give lodgment to so large a body as a fœtus near the full period of pregnancy. It might have been anticipated—which indeed almost always happens—that the sac would burst long before it acquired such a magnitude.

Of the four different kinds of extra-uterine pregnancy which I have enumerated above, the tubal is decidedly the most frequent, and the parietal the most rare; as Campbell's treatise abundantly shows. The occurrence of two of these varieties has been denied by good physiologists; though I have myself no doubt that they all occasionally happen. Thus, Velpeau * and Allen Thompson † do not believe in the existence of the ovarian; and Dubois, ‡ Merriman, § Dr. Clarke, ‖ and Campbell ¶ hold the same opinion regarding the abdominal, which Campbell, indeed, has called *ovario-tubal*.

As soon as any variety of this irregular impregnation is effected, although the ovum is not received into the uterus, a determination of blood is made to the uterine organ, and it enlarges in a partial degree as in natural and healthy pregnancy, sometimes acquiring two or three times its ordinary bulk. The deciduous membrane is formed within its cavity,** and the tough gelatinous

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* Trait. Elemen. de l'Art. des Accouch. vol. i. p. 19.

† Cyclop. of Anat. and Physiol. part xiii. p. 456, February, 1838.

‡ See Campbell's Memoir, p. 41.

§ Dissert. on Retroversion of the Uterus, p. 67.

‖ Transactions of Society for Diffusion of Med. Chirurg. Knowledge, vol. ii.

¶ Op. cit. pp. 39 and 146.

** Dr. Robert Lee does not think the deciduous [illegible]brane is always formed in the uterus in extra-uterine conception, but that it som[illegible]es surrounds the chorion; and he gives two cases (Med. Gazette, vol. xxvi. p. 436, June 5th, 1840), in which he says he found it enveloping that membrane. I cannot help believing that Dr. Lee has been led into a mistake; for in all the cases that I have seen, the decidua has either been found in the uterus, or it has been expelled by uterine action with some hæmorrhagic discharge, soon after or even before the death of the fœtus; and I have no doubt that in all the instances on record, where it was not observed within the uterine cavity, it had been, in the same way, expelled from it (See Campbell's Memoir, p. 144, for the same opinion). One of the cases relied on to prove that the deciduous membrane is not always secreted within the uterine cavity, is detailed by Mr. Douchez in the seventh volume of the Medical Gazette, p. 11. The lady, on the 11th of August, became the subject of a rupture of the cyst under tubal pregnancy, being ten weeks advanced. She lived fourteen hours after the accident; and it does not appear that any uterine pain or discharge occurred during that period. But in the previous month she was seized with violent pains in the hypogastrium, attended with uterine hæmorrhage, and the expulsion of large coagula, which mucus is secreted by the glands of its mouth and neck in sufficient quantity to close the orifice.

Sometimes the ovum arrives at full maturity: it then dies and putrefies. Inflammation takes place in the sac in which it lies; adhesion is formed between the sac and some of the neighbouring parts,—generally the large intestines,—and in process of time, if the patient lives, ulceration occurs, by which means the fœtus passes in a putrid and dissolved state into the bowels, and is evacuated piece-meal per anum.

In some instances the adhesion is contracted with the abdominal parietes, ulceration has followed, and the fœtal body, having been destroyed by putrefaction, has escaped externally. In others, again, communications have been formed between the cyst and the uterine cavity, the vagina, or the bladder; the latter, perhaps, is the rarest of the whole.*

Sometimes, after the fœtus dies, its soft parts are converted into a substance resembling adipocere; or, what is more common, it becomes coated with a bony, earthy, or semi-coriaceous crust, and remains comparatively innocuous during the continuance of life, producing little distress but what is occasioned by its weight and bulk.† Nor does the presence of an extra-uterine fœtus

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lasted a fortnight; and I have not the least doubt that the deciduous membrane was expelled unobserved with this discharge. I have myself seen the ovum surrounded by a cyst composed of a thick layer of coagulable lymph,—especially in one case, which I considered an abdominal gestation,—resembling, but certainly not a deciduous membrane; I quite accord with Breschet, indeed (Med. Chirurg. Trans. vol. xiii. p. 50), "that the membrana decidua is formed in the uterus, that it exists there before the arrival of the germ; that it does not belong to the embryo properly so called, and that it is not indispensable to the nutrition of the fœtus."

* For numerous references to such cases, see Campbell's Memoir, pp. 131 and 132.

† The length of time that a fœtus may remain in the abdomen, producing comparatively little distress, would not be credited, unless we had unequivocal proofs of the fact. Thus, in the Hist. de l'Academie Royal des Sciences, An. 1773, p. 270, a case is given of a fœtus lodging in the abdomen nine years. In the same publication, Part. ii. An. 1748, p. 73, there is an account of one weighing eight pounds, that had been retained thirty-five years, the woman dying of pulmonary disease, æt. 61. And in the same work for 1721, p. 422, we find another of a woman who conceived at forty-six, and lived till ninety-four, when an ossified fœtus was found in the abdomen; consequently she must have carried it forty-eight years; and she died at a very advanced age. In the Edinburgh Medical and Surgical Journal, vol. ii. p. 22, one retained twenty-six years; and of the same volume, p. 19, one between thirty and forty years. In the Medico-Chirurg. Transactions, vol. v. p. 104, one found in an osseous cyst retained fifty-two years. Campbell (Memoir, p. 45) mentions one that had been retained fifty-five years, communicated to him by Dr. Nebel, junior, of Heidelberg. In the Philosophical Transactions many cases may be found. In vol. ii. (abridged edition) p. 435, one of twenty-six years' standing, the fœtus weighing eight pounds, and the woman dying æt. sixty-four. Vol. v. p. 246, one twenty-eight years, the patient having given birth to two children, while she carried this extra-uterine fœtus, and dying at sixty-six; and in vol. v. p. 524, one fifty-six years; and the fœtus at the end of that time weighed eight pounds. A very great many of a similar kind might be quoted were it necessary to substantiate such a possibility. Denman, in his 13th plate, delineates an extra-uterine fœtus that had been conceived thirty-two years before the woman's death, during which period she

prevent a future conception occurring, if the patient be in other respects healthy; for instances of which I would also refer to Campbell's Memoir.* I myself knew a woman who had three children since an occurrence of this kind took place. My father was called to see her, when she was thought to be in labour: after continuing many hours, the uterine pains disappeared, but she remained as large as ever. There could be no doubt of the case being one of extra-uterine fœtation, because my father plainly felt the motion of the child when she thought herself in labour, and I have myself distinctly traced its limbs through the parietes of the abdomen. Since that time, indeed, I have attended her twice in labour; and a friend of mine also officiated on another like occasion. A case very similar is recorded in the January number of the Medico-Chirurgical Review for 1834, p. 163. A woman, in the year 1828, was received into the Cork-street Fever Hospital, in Dublin, with considerable enlargement of the abdomen. She stated, that eight years before, she was in labour for two days, but the child was never delivered. After remaining in bad health for two years, she again conceived, and went to her full time; that since then she had also borne two other children, one of them alive. Ultimately, a fistulous orifice formed near the umbilicus; the opening was enlarged, and the extra-uterine child removed, in an astonishing state of preservation. It measured twenty-two inches in length and had about two feet of umbilical cord attached to it.† In the same number, also, of the highly-talented journal I have just mentioned, another extraordinary case of extra-uterine pregnancy is recorded, communicated to the Academy of Medicine in Paris, in September, 1833. A woman, æt. seventy-eight, was brought into the anatomical theatre of Geneva, in whose body was found a hard tumour, occupying the right side of the pelvic cavity, and adhering intimately to the bladder, uterus, and vagina, although it did not communicate with any of them. On cutting into it, a fœtus of about three months age was discovered within, encrusted over with a layer of phosphate of lime. The woman was the mother of three children, had enjoyed good health, and died of the effects of age. From the history of her life, it was supposed the fœtus had been lodged in the abdomen for upwards of thirty years.

Instances have been known in which two extra-uterine fœtuses have occupied the abdomen at the same time; and Primrose ‡

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enjoyed good health. These narratives abundantly prove how wonderfully Nature accommodates herself to existing exigencies; and how powerful her resources are in overcoming dangers, that might truly be considered insurmountable.

* Note to p. 141 of the Memoir.

† See, for same case also, Montgomery, Signs and Symptoms of Pregnancy, p. 192.

‡ Primrose, Morb. Mul. Lib. iv. p. 316.

gives a very interesting case of this description, which occurred at the close of the sixteenth century. The woman conceived for the eighth time in March, 1591; and the fœtus lived to the end of nine months, when its movements ceased. Uterine pains came on, but in a short time subsided: and the patient regained her health; though the abdomen continued large, and a hard tumour was conspicuously evident on the right side of the umbilicus. Having menstruated regularly, she became impregnated again, about three years after; and towards the close of gestation the same occurrences took place as on the former occasion,—loss of fœtal movement, and expulsive, spasmodic pains. Another tumour, distinct from the first, was now discernible on the left side. The parts in the neighbourhood of the first became very tender; inflammation of the abdominal muscles shortly supervened; an abscess followed; and a large quantity of pus was evacuated, together with a number of fœtal bones. Two months afterwards it was determined to open the tumour on the left side; this was done, and from a cavity within the abdomen the bones of a second fœtus were extracted. Both apertures speedily healed; and the patient was soon restored to her usual state. There is no mention made of her having again become pregnant.

Cases are on record also in which, the conception being twin, one ovum found its way into the uterus, while the other was detained in the tube.*

It is a curious circumstance in the history of these cases, that if the child should live till the term of gestation is completed, as soon as that time has expired the uterus takes on itself expulsive action, which is attended with pain similar to the throes of labour, and during these pains, the deciduous membrane is expelled from the cavity, with more or less sanguineous discharge; the same also occurs on the death of the fœtus, provided that be premature. Life is *never* continued to the fœtus beyond the natural term of gestation,—nine calendar months from the time of impregnation; it generally, indeed, dies before that period is fulfilled.*

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* See a very remarkable and interesting case reported by Dr. Craghead, in the *American Journal of Medical Science*, and copied into the *London Medical Gazette*, June 7, 1850, p. 1006. The subject was a negro woman, who had borne two children previously, and supposed herself between three and four months pregnant. She had been harassed with unusual pains, like colic, for nearly three weeks, when she was suddenly seized with all the symptoms of loss of blood, accompanying the rupture of a cyst, containing an extra-uterine fœtus. She rallied somewhat, and in 36 hours aborted of a fœtus, five inches in length. She died about 48 hours after. On *post-mortem* inspection, it was discovered that a cyst formed in the left fallopian tube had burst, and a fœtus five inches and a half long, inclosed within its pellucid membranes, and floating in its liquor amnii, was observed within this sac. "The whole abdominal cavity was found filled with coagulated blood and serum." The uterus contained a "dark-coloured mass, which was, probably, a placenta;"—if so, of course, belonging to the embryo that had been conceived within the uterus, and expelled two days before death. Although no mention is made of the presence of a corpus luteum in either ovary (which is much to be regretted), it appears to me that the right ovary must have afforded the germ of the fœtus found in the uterus; because it is reported that the right fallopian tube was very much dilated in its entire length, and its muscles much softer and less fibrous than natural. So that we may conclude that the left ovary furnished the extra-uterine ovum, and the right that which made its way into the uterine cavity.

If, however, the conception be tubal, or parietal, it for the most part happens that the sac bursts long before the ovum has arrived at maturity—generally about the third or fourth month; it then escapes into the abdominal cavity, and the woman dies of internal hæmorrhage, occasioned by the rupture of the cyst.†

Thus, then, there are three natural terminations to an extra-uterine conception: either the sac bursts, (which is almost universally fatal, from hæmorrhage,) or the fœtus dies and putrefies, and perhaps escapes, by ulceration, through the intestines or abdominal parietes; and this is generally fatal, in consequence of the great depression accompanying this debilitating process; or, lastly, the fœtus dies, and remains an innocuous mass for an indefinite period of time; and this is the most fortunate termination of all, though probably the least likely to occur.

Cause.—We know so little of the mechanism of conception, that it would be idle and unprofitable to speculate deeply on the causes that may produce this deviation from Nature's established institutions. Explanations have been offered, founded on original conformation, pathological changes, and accidental occurrences. It has been noticed by Breschet‡ and Campbell§ that the uterus of the infant frequently possesses somewhat of a bifurcated formation, such as is natural to the monkey; and in a more striking degree to the female quadruped; and Boehmerus,* Morgagni,† and others ‡ have observed it in the adult subject. This anatomical formation has been supposed to favour the production of tubal or parietal extra-uterine impregnation. But almost all the cases on record have occurred to women who had previously borne a family; and we should presume, if such a shape of the uterus disposed to it, that it would be more frequently met with in first pregnancies.

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* In Perfect's case, although the motion of the child ceased at the end of nine months, no uterine action was established; but this is unusual. Vol. ii. p. 164.

† The immense quantity of blood which is effused into the peritoneal cavity from the rupture of a cyst that had contained an extra uterine ovum, even of very small dimensions, cannot but excite astonishment; more especially as in rupture of the uterus, when the fœtus has arrived at maturity, the hæmorrhage is comparatively trifling. For instance, in the Transactions of the Royal Society of Edinburgh, 1800, the ovum being the size of a bean, four pints were effused; in the Archiv. General. Jan. 1838, the ovum under two months, between three and four pounds were found; in Lond. Med. Gazette, vol. vii., the ovum ten weeks, six pounds; in the British and Foreign Med. Review, vol. vi. 1837, the ovum the size of a walnut, two wash-hand basins full; in the Transactions of a Society for the Improvement of Medical and Chirurgical Knowledge, vol. i., the ovum between six and seven weeks, a gallon; and a case given by the late Dr. A. Duncan of Edinburgh, the ovum in the second month, between eight and ten pounds. I might quote very many more instances, where the quantity of blood discovered in the abdomen consequent on this accident was equally enormous, in reference to the early age of the ovum; and indeed in those cases of ruptured cyst which I have witnessed, all who were present at the dissection were perfectly surprised at the immense loss which had taken place from the laceration of such apparently minute vessels.

‡ Memoir in Repert. Anat. Phys. Pathol. &c. vol. i. § Memoir, p. 115.

Again, a morbid condition of that fallopian tube through which the ovum is passing, has been supposed to explain it; such as an impervious state taking place after conception; a contraction of its calibre, owing to *engorgement* of its lining membrane, or spasm of its fibres, or paralysis affecting its structure; and it has been attributed to disease existing in the coats of the ovum itself.

Among the accidental occurrences much importance has been attached to mental agitation on the part of the woman, while in the enjoyment of the conjugal embrace; and some cases are recorded, in which this irregularity has followed a shock or surprise received *in coitu*. Thus a case by the late Baudelocque was supposed to have depended on the woman's hearing, while in the embraces of her lover, somebody trying to enter the apartment.§ Another very similar is also reported;|| and a third where the woman experienced much alarm by a stone being thrown through the window of her chamber during the time of connexion;¶ but it is very doubtful in my mind whether such a cause could produce the effect now under consideration. The fact, however, of a large relative proportion of unmarried females having become the subjects of the complaint,** would afford some foundation for the idea taken up by Astruc,†† Josephus,‡‡ and Burdach,§§ that such persons are more liable to be afflicted with extra-uterine gestations, than women of regular habits and steady character.

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* Fas. ii. Obs. 5.

† Epist. iii. art. 21.

‡ Archiv. Gen. vol. xi. 1826. Med. Chirurgical Transactions, vol. xvii. p. 731.

§ Dict. des Sciences Med. vol. xix. p. 399.

|| Lallemand, Nouv. Jour. de Med. vol. ii. p. 320.

¶ Archiv. Gener. vol. xxviii. p. 208.

** Campbell, Memoir, p. 108, says, that out of a series of fifteen cases, five were single women: certainly a large proportion.

†† Traité des Maladies des Fémmes, 1765, vol. iv. p. 106.

‡‡ Ueber die Schwangerschaft ausserhalb der Gebärmutter, p. 57.

§§ Physiol. traduit de l'Allemand par Jourdan, 1838, vol. ii. p. 35. In the original German edition of 1828, vol. ii. p. 10. Montgomery, in a case reported by Jackson in the Dublin Med. Journal, vol. ii. for 1833, p. 137, thinks that a blow received on the abdomen shortly after conception, produced such a degree of inflammation and *engorgement*, as to arrest the ovule in its transit from the ovarium.

Symptoms.—The symptoms are at first very indefinite and obscure; they are generally those of incipient pregnancy; the menses become suppressed; the breasts enlarge; and the areolæ are more evident; there is morning sickness; but more local pain is felt; and this pain is referred to one point of the side, mostly low down, within one or other ilium. It may depend on inflammation, or perhaps, which is more probable, on the cyst not yielding kindly to the growing ovum. In some instances, indeed, the patients have enjoyed uninterrupted good health, until a period nearly approaching the full term of ordinary gestation, but this is not common. If the child continues to live, it quickens; but the motion is also felt more on one side than the other, and is usually attended with much suffering; the patient increases in size, and is satisfied she is pregnant. Sometimes the child's limbs can be traced through the parietes of the abdomen, especially in conception of the belly. The catamenia have been known to continue with regularity for the first five or six months; but more usually, when there has been any coloured discharge from the vagina, it has appeared at uncertain intervals, has been profuse in quantity, and attended with the expulsion of coagula; sometimes, indeed, with masses of fleshy substances that have been mistaken for moles, or with portions of what has been considered the placenta. These phenomena have given rise to the belief that the patients had miscarried. The bowels are usually constipated, after four or five months; and the urine is passed frequently, and with pain.

On making an examination per vaginam, the os uteri may be felt easily, or it may be raised so high by a portion of the child's body occupying the pelvis, as to be beyond the reach of the finger; and if it can be touched, the uterus will be found unimpregnated, though rather larger and heavier than in its virgin state; with the cervix not at all, or but slightly, developed. A foot or hand, or the head of the child, or some other portion of its body, may occasionally be felt through the coats of the vagina.* After the child's death, and when the efforts made by the uterus to expel it have ceased, which are evidenced by the spasmodic pains that I have already mentioned, accompanied by some sanguineous discharge, milk is generally secreted in the breasts, but it rapidly disappears; the abdomen after a time diminishes somewhat in size; and the tumour may remain without any alteration in its volume, producing little or no distress; or the woman may gradually become larger in her person even after the child has ceased to live, in consequence of the secretion of an increased quantity of fluid, as I have known happen in two cases. If putrefaction, however, takes place, symptoms of general abdominal inflammation supervene; and when the ulcerative process is established, it is attended with extreme depression, small quick pulse, hurried and painful respiration, entire loss of appetite, great emaciation, hectic fever, absence of sleep, vomiting and purging. Together with the fæces, pus, and large quantities of most offensive putrid matter, are from time to time evacuated, consisting of the flesh in a semi-fluid state; and shortly a few fœtal bones are also observed to pass. This may, perhaps, give the first indication of the true nature of the case; and the patient's size diminishes in proportion as the evacuations are copious. Should she bear up against the weakening effects of such destructive actions, the whole contents of the sac will be expelled *seriatim*, the time occupied varying exceedingly, but generally lasting over some months; and when they have entirely passed, the healing process is set up, and the patient may be restored to comparative health. Sometimes there is but one communication established with the alimentary canal, at others there are two or three; sometimes, also, ulceration takes place between the sac and the uterus, or vagina; at others, again, the adhesion is formed between the sac and the abdominal parietes, the contents point as an abscess, and are evacuated externally. I am pretty well persuaded that those cases on record, in which it is supposed that a fœtus lay for an indefinite period in utero, without being expelled, or that it had died in the womb, and had made its way in time outwardly by ulceration,* were indeed instances of different varieties of extra-uterine gestation.

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* An unmarried woman, an out-patient at the London Hospital, was referred to me by the surgeon under whose care she was placed, for my opinion. Suspecting she was pregnant, I required to make a vaginal examination. I found the os uteri canted high up, behind the symphysis pubis, the uterus unimpregnated, and a tumour in the pelvis between the rectum and vagina, which I had no difficulty in recognising as the head of a fœtus of about six or seven months' age. I could feel the anterior fontanelle distinctly, and on steady pressure being applied to the most solid part of the tumour, an indentation was caused, which, however, disappeared with a smart rebound, when the finger was withdrawn, exactly as the bones of the cranium of a premature fœtus would do. I desired her to come to the hospital again, intending, in the mean time, to make arrangements for her admission into the house. This she unhesitatingly promised to do; but she never returned; and I have heard nothing of her since. I had requested one of the pupils to take down her address; and caused inquiry to be made for her, as she did not return; the address, however, proved fictitious.

Should the cyst burst, a very different train of symptoms from those above mentioned show themselves. It is probable that the patient may have considered she was advancing in healthy pregnancy; and no indication may have appeared to lead to the knowledge that this serious irregularity existed, beyond some occasional pains that could not easily be accounted for; when she is suddenly seized with the most violent cramp in the side of the abdomen, bearing more the character of colic than any other kind of pain. From that moment the vital powers begin to flag, and a state of extreme depression soon comes on. The symptoms, indeed, of hæmorrhage, one after the other, appear, (in addition to the excruciating abdominal suffering,) until she sinks, within a few hours of the rupture taking place; for very rarely indeed has recovery happened under such circumstances. We cannot be surprised at the violence of the symptoms, when we reflect that they are occasioned by the combined influence of internal hæmorrhage, laceration, and the effusion of a large quantity of blood into the delicate and highly sensitive peritoneal cavity.*

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* See Merriman's Memoir on Retroversion of the Uterus, 1810, p. 45 *et seq.*

Treatment.—Our treatment must depend entirely on the symptoms, and must be directed towards the relief of pain, and assisting Nature in her efforts to get rid of the offending mass. The bladder must be particularly attended to. The pain may be relieved by opiates, and perhaps by local blood-letting; and Nature may be assisted in keeping up the strength by tonic medicines, good diet, wine, and cordials, during the process of putrefaction and ulceration. Should any of the bones, in their passage through the rectum, become fixed in that bowel, which is very likely to happen with the broad bones of the skull, the femur, and some others—as indeed I have myself known,—they may be carefully removed, either by the fingers, or a pair of forceps. It has been recommended—the child being still alive—that an incision should be made, either through the vagina upon the head, breech, or foot, (provided either of these parts could be felt low down in the pelvis, and the nature of the case admitted of no doubt,) or through the abdominal muscles; and that the child should be extracted by the forceps or hand, for the sake of its preservation. Both these operations have been carried into effect. Lauverjat† relates a case, in which the fœtus was extracted by incision through the vagina, and the woman recovered. Delisle‡ gives one in which it was extracted alive by cutting through the vagina. The woman died in a quarter of an hour, and the child in less than an hour after its birth. Another is given in the Archives Générales, in which the child was extracted living; but the mother died on the fourth day.§ One case is recorded in which both the mother and infant were saved‖ by a similar operation. The last, I believe, of this kind put on record is given by Baudelocque.* The child having been extracted by the vagina, breathed once. The placenta was torn away piecemeal; and the woman died of hæmorrhage almost immediately.

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* It would seem that rupture of the sac is not invariably fatal, as a case given by Ingleby (Edinb. Med. Surg. Journal, vol. xlii. p. 358),—in which no doubt existed in his mind that the cyst surrounding an ovum in the sixth or seventh week had given way, and the lady recovered—would prove. Another case is related in Med. Phys. Journ. vol. lix. p. 377, in which the patient survived five months after the bursting or ulceration of a cyst that had contained an eight month's fœtus.

† De la Méd. Opérat., tom. i. p. 136. A similar case is recorded in the Journal des Sçavans, 1722.

‡ Bulletin de la Société Méd. d'Emulation, for May and June, 1818.

§ Vol. xxi. p. 286.

‖ Lond. Med. Repos. vol. xii. p. 241; from the New York Med. Repository.

In many instances the abdominal parietes have been divided, and the fœtal body extracted in that manner; but in by far the greater number of these cases suppuration had occurred, and an ulcer had been previously formed by Nature for the evacuation of the offending body; the operation then merely consisted in enlarging the aperture thus spontaneously made. Campbell† gives us some valuable information on this subject, and appends full references as authorities for his statement. He tells us, "That of thirty cases in which gastrotomy was performed, or the breach dilated, twenty-eight patients recovered. In twelve cases of gastrotomy, performed after the suppurative process was well advanced, ten of the operations were successful. Of nine women operated on, however, during the existence of fœtal life, or soon after its extinction, the whole died. By these fifty-one operations, only two children were preserved; and in one of these, even, the details are too marvellous for belief." I shall add another of complete success, as far as the mother was concerned,‡ that came under my notice, which Campbell has not quoted, because it involves many points of great interest.

A woman who had been ten years married, but never pregnant before, considered that she fell with child towards the end of July, 1834. She had all the symptoms of pregnancy—suspension of the catamenia, morning sickness, enlargement of the breasts, deeply shaded areola, and a secretion of milky fluid. At the end of September her abdomen had acquired a considerable increase of size; but it was observed that she was larger on the left side than the right. She became now subject to occasional spasmodic pains in the back and epigastric region, so violent as to cause syncope, and deprive her of all consciousness while they lasted. She thought she felt the movements of the child in October, but in November she had no doubt of it; and they became progressively more perceptible to her. Her size had so rapidly increased, that at the end of January she was as large as most women at the full term of pregnancy. At the end of April she was seized with periodical uterine pains, attended with much expulsive effort, and considerable discharge, mostly sanguineous;—together with the fluid discharge some "stringy matters" were evacuated from the uterus. She considered herself in labour, especially as she calculated that she had now arrived at the close of pregnancy. The pains continued more or less for nearly three weeks, during which time she suffered at intervals great agony from the restlessness of the child; and then its movements ceased to be felt altogether. Still, however, her abdomen progressively enlarged, and her legs became œdematous. From the end of May she gradually wasted in the arms and bosom, but the abdomen did not decrease in the least. She continued to get worse till July 9th, when my father saw her in consultation with Mr. Hutchinson, who had lately been attending her. She was then much emaciated: the pulse 115; respiration laborious, with a sense of suffocation, when recumbent; tongue dry and furred; there was always a disagreeable taste in the mouth; a frequent vomiting of white frothy fluid; pain in the back; obstinate constipation; constant desire to pass urine, which was voided in small quantities at a time; and its evacuation afforded only a temporary relief from the painful sense of distension under which she suffered. She had frequent forcing and bearing-down pains, with cramps in the legs; and her nights were disturbed and sleepless. The abdomen was much distended, partly by a solid body, and partly by a large quantity of fluid, whose presence was indicated by distinct fluctuation. On examination *per vaginam*, a large tumour was felt between that canal and the rectum, while the os uteri was forced upwards and forwards, behind the pubes, its fundus being directed backwards.

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* Journal des Connois. Médicales, Janvier, 1842; transcribed in Med. Surg. Journ. April, 1843, p. 509.

† Memoir, p. 150.

‡ See Medical Gazette, vol. xvii. p. 169, Nov. 7, 1835; where the case is reported more at length by Mr. Hutchinson.

My father, knowing how prone women are to be deceived regarding the movement of a child as an indication of pregnancy, and taking into consideration that the abdomen had been enlarging since the movements ceased, looked upon the case as one of ovarian disease of that mixed character which is often met with, the gland being converted, partly into a solid tumour, and partly into one or more cysts containing fluid; and he recommended tapping. As the case, however, presented some obscurity, he requested me to see her with him before the operation was performed. This I did on the 12th; and coincided in the opinion of the existence of ovarian disease; but I thought the sensation of fluctuation too distinct for the fluid to be inclosed within a cyst; and therefore regarded it as a solid ovarian tumour, combined with ascites. As the sense of suffocation was most distressing, I advised that the fluid should be let out with as little delay as possible; and in the propriety of doing so Mr. Hutchinson concurred. The operation of tapping was performed on the 15th in my presence; the trochar was introduced in the linea alba, about two inches above the umbilicus, where the abdomen was most prominent; and six pints of a thick, sizy, chocolate-coloured fluid escaped, possessing an unpleasant, though not highly fœtid, odour. She was instantly relieved from the suffocating sensations. The character of the fluid surprised me, as I was previously impressed with the idea that it was contained within the peritoneal sac; the aperture did not heal; and an oozing of the same kind of matter continued, which, however, became by degrees, in a few days, offensively fœtid. A fortnight after the operation a small lock of fine, silky, fœtal hair was evacuated.

When this was shown to me I was convinced that we had been mistaken in regarding the case as simple ovarian disease; and that it really was one of extra-uterine gestation. From this time pieces of the same kind of hair passed repeatedly, as well as globules of oil, and small portions of cuticle in a putrid state, with some pieces of membrane, that the woman likened to the intestines of an infant, as she could draw them out to a considerable length by her fingers, but which were parts of the amnion and chorion. The general bulk of the abdomen was, of course, much lessened; but a hard, solid substance remained; and the fœtal head could be traced occupying the left hypochondrium.

She went on much in the same way through August, but by the middle of September the symptoms were much aggravated; she was then suffering exceedingly from constitutional irritation; the pulse was never under 120; and she had completely lost her appetite, which she attributed to the effluvium of the offensive matter that was constantly escaping through the wound. On September 21, I again met Mr. Hutchinson; and he proposed to remove the child by incision. To this I at first objected, fearing, in her almost hectic condition, she would not survive the extensive incision necessary for its extraction, and thinking that its body must be so far decomposed as to oblige us to introduce the hand frequently into the abdomen, in order to get the whole away. I recommended, however, that the opening should be slightly enlarged, both with the view of giving a more free exit to the fluid, as also that we might examine by the finger more accurately the degree of decomposition that had taken place. On the 22nd, Mr. Hutchinson enlarged the opening by means of a bistoury to the extent of two inches, and the fœtal body was found to retain much greater firmness and solidity than was anticipated. One objection, therefore, to the removal of the dead mass had vanished; but the other still remained. Under these circumstances it was agreed to seek the opinion of a consulting surgeon, whose advice was to regulate our future proceedings. Mr. Mayo met us on the next day, and Mr. Margetson also kindly gave us his assistance. It was now agreed that the artificial removal offered the best chance to the poor patient, and the operation was undertaken by Mr. Hutchinson immediately. He enlarged the incision upwards and downwards to the extent of about five inches. Mr. Mayo then introduced his hand to remove the child, and grasped an upper extremity, which he brought out of the wound. The transverse position of the fœtus, however, prevented its being extracted by that member: the arm was therefore quickly separated at the shoulder; and I passed my hand into the cavity, and having immediately met with the feet, drew the trunk forth by their agency. It being discovered that the head was too large to pass entire, a scalpel was thrust into the cranium through the lambdoidal suture; a quantity of very offensive gas instantly escaped, the bones collapsed, and the head passed readily.

The removal of the child was followed by a flow of the same kind of offensive, brown, putrid fluid which had before escaped. The funis was divided; a portion of it, with some of the membranes of the ovum, was left hanging out of the wound. As upon gently pulling at the funis, the placenta did not part from its attachment to the bowels, no attempt was then made to take it away. The wound was dressed with a strip or two of adhesive plaister, and poulticed; an opening being left at the lower part, to permit the escape of the fluid still within the cyst.

The operation did not occupy more than five minutes, and was borne by the patient with great fortitude; indeed it did not appear to be very painful. No vessel was divided that required to be secured; though a slight faintness came on soon after its completion. The fœtus was as large as an ordinary one at full time; and the cuticle was perfect except on the scalp, where it had entirely separated, and over the vertebræ, and the joints of the fingers and toes, which were also denuded.

On the next day she expressed herself as much relieved; had passed a good night; the pulse was 115; no rigor, nor sickness, nor pain, nor tension of the abdomen. The bladder had acted two or three times; and a natural motion had been voided. A larger portion of the membranes was protruding from the wound, than was hanging out the day before; she complained of feeling hungry; the dressings were not disturbed; she was allowed a little broth.

On the 25th she was still better, and had slept well; the pulse had fallen to 100; the bowels and bladder had acted; the fluid discharge since yesterday had been trifling; but there was a considerable portion of the placenta offering itself at the wound. The whole of this organ was drawn away most easily by a pair of forceps: it was perfectly putrid; the cellular web having been entirely destroyed; and the vessels, separated from each other, hung down like a bundle of strings. It had the appearance, indeed, of having been a long time macerated in water. It was smaller than a uterine placenta. About a pint of fœtid fluid followed its extraction.

From this date she continued steadily to improve, the discharge varying daily from about four to eight ounces, but still very fœtid in character. Not a single bad symptom appeared till October 2, when she complained of slight gastric uneasiness, which she attributed to having eaten some turnips. To relieve this a mild dose of compound decoction of aloes was administered; it produced, however, so much purging, that it was necessary to control it by an astringent, which was easily effected. The wound at this time was very much contracted, and the edges were granulating kindly.

No farther bad symptoms appeared till the 8th, when she was attacked with constant pain on the right side of the abdomen, extending from the ribs to the spine of the ilium, and the least pressure caused an aggravation; there was also sympathetic fever. The discharge from the wound had become altered both in colour and smell; it was now yellowish, as if bile was mixed with it, and it possessed a slight fæcal odour. Pressure on the right side of the abdomen produced an increase of this new discharge through the wound, as also an evacuation of gas. It was quite clear that an opening had been made by ulceration into some part of the intestinal canal, because, independently of the appearance of the discharge, its odour, and the escape of gas, for two successive days some currants, which she had taken in a pudding some days before, passed through the wound. Fomentations relieved the pain, and saline medicines seemed to allay the fever. She again began to mend, though fæculent matter passed occasionally through the incision. The size of the aperture gradually diminished; her countenance improved; her appetite returned; and all the natural functions seemed to be properly performed. On the 26th the opening had contracted to about half an inch; the discharge consisted entirely of pus, and that in small quantity, from the granulating surface; the flaccidity of the abdominal parietes, consequent on the extraction of the child, had quite disappeared; she had been able to sit up, dressed, for two or three hours daily without fatigue; and could walk without pain. She regained her strength, flesh, and colour, gradually; and in four months from the operation menstruated. She has never been impregnated since. Indeed, soon after her recovery she was obliged to separate from her husband, through his ill-usage. She now has the appearance of a woman in ordinary health.*

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* Cyprianus (Epistola ad Thomam Milington) was among the first who removed a fœtus from the abdomen by incision, towards the end of the seventeenth century. His patient had three children after; once a single birth, and once twins.

One circumstance worthy of note in this case is the fact, that although the fœtus remained within the abdomen nearly three months subsequently to its death, putrefaction did not commence until after the trochar had been used, and the external air consequently admitted into the cyst wherein it lay. Another is the woman's enlarging in size, apparently dependent on an increased secretion of fluid within the cyst, after the child's death. A third, the facility with which the placenta was separated from its attachment on the second day after the operation, although we could not detach it at the time; and a fourth, the slight constitutional disturbance that was set up as a consequence of such an extensive incision; in fact, the patient was better for some days after the removal of the child than she had been for a long time before; and this would incline us to believe that the peritoneal cavity was not exposed; but that that delicate membrane was protected by adhesive lymph thrown out around the ovum, forming a complete shut sac.

The history of this case, as well as those referred to by Campbell, would dispose us to think favourably of gastrotomy after the fœtus was dead, and putrefaction had commenced; but the result of the cases on record, in which attempts were made to save the child's life by operation, would teach us that such a proceeding is almost always fatal to the mother, and should therefore not be entertained. At the same time I would beg to impress my readers with the necessity of forming an accurate diagnosis before the knife is used; since it has happened that the abdomen has been laid open with the view of removing an extra-uterine fœtus, supposed to be lodging there, when the hard tumour was discovered to consist of nothing more than a collection of indurated fæces.*

It cannot be necessary to lay down any rule of treatment for those cases in which the cyst bursts and the contents pass into the abdominal cavity; because such are almost always rapidly fatal; and because it is evident that stimulants, and opiates, with the application of warmth to the extremities, when they are below the natural temperature,—such means indeed as are most likely to allay pain, and sustain the sinking powers,—are those remedies that would occur to every one's mind, as the most appropriate, however little good might be expected from them. Nor do I think it requisite to treat of the management of those cases in which the fœtus dies and remains an innocuous mass within the abdomen; because no specific plan can be laid down, nor any instructions given beyond the general direction to combat whatever morbid symptoms may arise by the means most suitable to allay them.

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* This case occurred in Berlin in 1828; see Siebold's Journal, vol. ix. p. 737.

I have *personally* known fourteen cases of extra-uterine conception, and the result of these cases is the following:—In four instances death took place from a rupture of the sac and internal hæmorrhage, evidenced by dissection—three were tubal varieties, and one parietal. In five cases death occurred during the process of ulceration for the purpose of evacuating the sac—four of these were abdominal, and one parietal;—the case, indeed, detailed in full above. One of these five women sank, worn out by diarrhœa and low fever, fifteen months after the death of her fœtus within her, which lived till the completion of nine months from conception. I saw her first about six weeks after its death, and pronounced the case to be one of extra-uterine pregnancy. She was then, however, walking about the house, apparently in good health, and I did not think it right to recommend any operation for its removal at that time. I requested her medical attendant to watch her closely, and on the first symptoms of any irritative fever or abdominal distress to apprise me of it. I saw her occasionally, though, as she lived some little distance from London, rarely. In three months she began to increase in size, evidently from an augmentation in the quantity of the fluid contained in the abdomen, and as the accumulation distressed her it was thought right, in about three weeks more, to tap her. Nearly a pint of dark fluid was evacuated with relief; and for seven months she continued to perform her domestic duties regularly; but about eleven months after my first visit the symptoms which I had expected showed themselves. Her attendant now strongly urged the propriety of an operation, which was perseveringly objected to, both by herself and her husband; and he, therefore, did not think it worth while to inform me of her altered condition. Obstinate diarrhœa came on, which rapidly destroyed her. Dissection discovered a full-grown, well-developed fœtus in the abdominal cavity, which had undergone a certain amount of putrefaction. Thus the correctness of the diagnosis was verified; and I have little doubt she would have survived, if she had allowed the fœtus to be extracted by incision.* Four women recovered—two, in whom the bones have passed per anum; one, who is still I believe alive, with the fœtus, conceived many years ago, remaining within her; and the fourth, whose case I have given at length, where the child was extracted from the abdomen by incision. Another, the patient for whom I was consulted ten years since at the London Hospital; and in which case Nature had not then made any effort to get rid of the child, whose subsequent history I am not acquainted with.

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* This case will be found reported by me more at length in the Med. Times and Gazette for Nov. 13, 1852, p. 481.

ABORTION.

Definition.—By abortion or miscarriage, is meant the premature expulsion of the contents of the gravid womb, before the term of gestation is completed; and the process, like that of labour, is perfected by the action of the uterine fibres.

I propose to consider abortion under two principal divisions:—the first embracing those cases which are unattended with dangerous hæmorrhage,—and the second, those in which the loss of blood is so great as to cause alarm. I shall also follow Denman's arrangement, considering miscarriages of the first six months as abortions, and those of the last three as premature labour. This is by no means an arbitrary division, or one practically useless, as there are many remedial means which can be applied under a miscarriage of the last three months of utero-gestation, if they should be found necessary—such as the introduction of the hand, for the removal of the contents of the gravid womb—which are perfectly inadmissible in the first six; and, on the contrary, there are many means which we may rely on with some assurance of success during the first six months of pregnancy, which we should be blameable in trusting to entirely in the last three; so that it embraces a practical point of no little consequence; and I therefore would limit the term abortion to a case where the contents of the womb are thrown off previously to the completion of six months. Most of the continental authors divide the premature expulsion of the ovum into three heads;—abortion, when it occurs within sixteen weeks; miscarriage, when within seven months; and premature labour, when between that period and the full term. Rhoederer[*] classes all cases before seven months as abortions or miscarriages, all after as premature labours; because the child has but little chance of living before that time; and Rigby[†] follows him for the same reason.

History.—All women are subject to abort; but it is more frequently observed among the higher classes, in those who lead a luxurious life, than among the hard-working population. Labouring women are, indeed, much more exposed to accidental causes of miscarriage than those moving in the better circles; but this liability in the one is more than compensated for by the excitability of the nervous system, and the high degree of sensitiveness, consequent on the life of refinement and indolence led by the other. There is no animal whose habits we are acquainted with, that may not lose the fruit of conception prematurely. To the domestic it occurs much more frequently than to those in a wild state; and I think we should find, that, in an uncivilised condition of human society, abortion would be comparatively rare.

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[*] Elem. Artis Obstetr. cap. xxiii. parag. 716.

[†] Lib. of Med. vol. vi. p. 86.

The process of abortion consists of two parts—the separation of the ovum from its uterine attachment, and its expulsion from the uterine cavity. The separation is attended with some loss of blood, the expulsion with pain. The embryo may be thrown off at any period of utero-gestation, the process being completed by uterine action. The ovum may pass whole from the uterus, and this is generally the case in the early weeks; or the membranous cyst may burst, the fœtus may be expelled first, and the placenta afterwards; as usually happens at a more advanced stage.

The vitality of the ovum may have been destroyed some hours, days, or weeks, previously to its expulsion, or it may be actually alive at the moment it is thrown off. It is a matter of great consequence, whenever abortion is threatened, that we should be able to ascertain, if possible, whether the ovum be living or dead: because, if we were assured that it still retained its vitality, it would be our duty, for the sake of its preservation, to endeavour to carry the patient on to her full period; unless, indeed, her existence were endangered; but, on the contrary, if we were certain the ovum was lifeless, there would be no object in preserving it within the uterine cavity; by so doing, indeed, we might originate many evils:—the mass might putrefy;—it would, at any rate, act as a foreign and offending body; and it might possibly be converted into a mole, or become a nidus for hydatidinous formations. From the opportunities I have had of examining different ova that have passed under abortion, I am persuaded that their death has in most instances preceded their expulsion, since I have found their structure generally imperfect, or their organization diseased. The uncertainty then that must exist in our mind as to whether the ovum were alive or dead, in any case we may be called upon to treat, is a strong reason why we should be most guarded in any prognosis we give as to the probability of warding off a threatened miscarriage. In the latter months the sensations communicated to the mother by the motion of the fœtal limbs will be our most sure guide to determine that the fœtus is alive. We may also, if we have gained the requisite degree of tact, acquire the same information by the stethoscope [illegible] in the early weeks of pregnancy, before quickening has taken place, neither of these means of diagnosis will serve our purpose.

We judge, then, of the death of the young ovum by the sympathetic irritations of pregnancy being suddenly suspended. The cessation of the morning sickness is one of the most common accompaniments of lost vitality in the ovum. It will happen that a patient who has been regularly attacked by morning sickness up to a certain day, on rising from her bed finds herself freed from the inconvenience; and it does not again appear: she considers this a fortunate occurrence, and congratulates herself that she is no longer subject to the annoyance. If this cessation has been gradual, and has occurred about the time of quickening, we may suppose that its disappearance is attributable to a natural cause, since the vomiting, although it might have been troublesome before, almost always gives way near the middle period of gestation; but if it cease suddenly, about the end of the second or third month, instead of viewing it in a favourable light, we ought to regard it with suspicion and anxiety; because the circumstance will very probably depend on the death of the ovum. The sudden loss of the other sympathetic irritations connected with pregnancy —such as toothache, or the increased secretion of saliva,—indicate also that vitality is destroyed; and if with these prominent marks, the breasts become flaccid, and the milky secretion (provided there has been any) is no longer formed; if the lower abdomen should become smaller instead of increasing; if the patient complains of feeling a sensation of weight in the hypogastric region, to which she was previously a stranger, little doubt can remain that gestation is arrested by the ovum having perished.

The ovum may be expelled from the uterine cavity at any period subsequently to its death. It is sometimes retained many weeks after it has lost its life; but it is a very unusual, and certainly an abnormal occurrence, for an ovum to continue dead in the womb beyond nine months from conception. I have often known one that had perished early in gestation lie *in utero*, without producing any serious symptoms, until the natural term of healthy gestation was completed; but very seldom indeed have I had reason to believe that the ordinary period of pregnancy had been passed. It is worthy of remark that however late it may be retained, putrefaction does not take place in it so long as it remains whole, and unbroken.

If the conception have been originally twin, both ova may be thrown off together, or one may be expelled and the other retained for some hours, or weeks, or perhaps even to the end of gestation. Numerous cases are on record, where one has slipped away, as it were, during the early weeks of pregnancy,—being expelled with scarcely any uterine effort,—and another has been carried on to maturity.*

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* This occurrence was known to the ancients; for in Pliny, (Nat. His. Lib. vii. Cap. 10,) we find "*Vopiscos appellabunt è geminis, qui retenti utero nascerentur, altero interempto abortu.*" It should be kept in mind, as it may elucidate cases that otherwise would appear inexplicable. For example, if a patient consult us, as has happened

Abortion is always accompanied with loss of blood, to a greater or less extent; sometimes the quantity which flows away amounts to a fearful hæmorrhage, at others there is little more than a few stains.

The time occupied by an abortion varies exceedingly; occasionally the entire process will be completed in an hour, or even less; at other times, many days, or some weeks, may elapse, before the uterus has got rid of its whole contents. The expulsion of the ovum is always followed by some sanguineous discharge, of a similar character to the lochia subsequent to labour.

Sometimes, though this may be considered as an exception to the general rule, the suffering under abortion is very great, the pain being even more than the same patient has ever experienced in labour at full time. And this may be explained not only upon the unusual acuteness of the nervous sensibility then perhaps existing, but also on the indisposition that the undeveloped cervix evinces to relax and open. In the early period of pregnancy this part of the uterine structure consists of a lengthened and rigid canal, which is evidently intended by Nature to stand as a protecting and preservative power, against the sudden passage of the young ovum from its uterine nest. It therefore resists the efforts made by the expulsive action of the organ; and if overcome by the pertinacity of the contractile forces, it yields at last unwillingly, and with evident reluctance. It is this indisposition to open which causes the ovum so often to be detained in its transit, after having been entirely separated from its uterine attachment; and in which case its removal by the finger is so easily accomplished, and so frequently attended by much immediate benefit.

We may consider abortion as either accidental or habitual; it may be the result of sudden mental emotion, or some accident which the person has been subjected to; or it may be habitual, and the patient may abort constantly about the same period of pregnancy, no ostensible cause being discoverable. When it is habitual, we usually observe that it takes place between the end of the eighth and twelfth weeks; and often at the period when the menses might have been next expected, if pregnancy had not interfered with their return.

In those cases where an ovum has been expelled three or four times in succession, at the same period of pregnancy, we have

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to myself two or three times, with a history such as the following; "that she had miscarried two or three months before, that her ordinary medical attendant had seen the ovum, and had assured her that it had passed; but that she was satisfied he must have been mistaken; for she was not only increasing regularly in size, but felt the movements of her infant distinctly;" we may clear up her doubts, and preserve her confidence in her previous adviser, by telling her that both he and she were right, and explaining to her the true nature of the accident of which she has been the subject.

good reason to attribute the occurrence to some agency referable to the maternal system; because it is not likely that any morbid action would attack a number of successive ova exactly at the same epoch of their lives, so as to destroy them, and thus excite the uterus to expel them. This then should give us more confidence in insisting upon our preventive measures; unless indeed we were aware of some change of structure existing in that particular uterus, or of some organic disease situated within the pelvis.

Causes.—The causes of abortion are immediate, predisposing, and exciting.

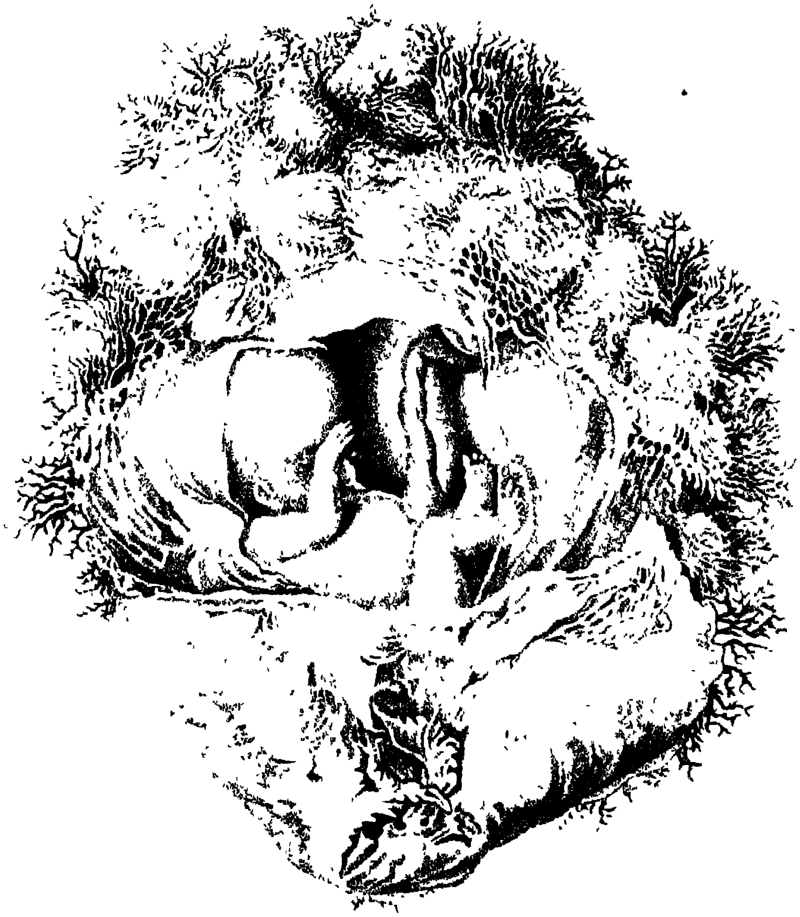
The immediate cause is contraction of the uterus: the uterine fibres, acting upon the ovum, protrude it forth through the dilated orifice in the same way that they expel the mature fœtus at the end of gestation.

In many cases, no predisposing cause exists; but the patient is subjected to one or more very evident exciting causes. Thus a woman in a state of good health, while gestation is proceeding regularly, receives a blow, or meets with a fall, or becomes the subject of some violent mental agitation. These act as exciting causes, and produce uterine contraction. But where we cannot trace any evident exciting cause, we may reasonably infer that there are some predisposing influences acting on the woman's system; and these are various and numerous. They may be local and general. Of the local, weakness of the uterine organ, induced by too frequent an indulgence in venery, by constant miscarriages, or by debilitating discharges, are perhaps the most usual; prolapsus uteri is another, by no means rare. Adhesions, which the uterus may have contracted with other organs, as noticed by Madame Boivin, may be considered both a predisposing and exciting cause. This ingenious lady found, in the course of her dissections, that in many of those women who always aborted when they arrived at a particular period of pregnancy, the uterus had contracted adhesions with the neighbouring viscera and the general pelvic cavity. If these adhesions with the bladder, rectum, or other organs, have taken place to any considerable extent, we can easily understand that it is impossible for the uterus to become evolved so perfectly and regularly as if it were free and unshackled: as it cannot enlarge, therefore, and will not remain stationary, while the ovum lives and grows, it is compelled to contract, and abortion is the consequence. Indolent tumours, imbedded in the fleshy substance of the uterus, and tumours situated in the broad ligaments, may prevent the due evolution of the organ; and they will probably also excite it to contract.

Nor are the predisposing causes in the general system less numerous or powerful: they consist principally in circumstances of a debilitating nature, by which the system becomes undermined, the general health destroyed, and the functions of every other important organ, as well as of the uterus, more or less impaired. Under such a state, the fœtus may die for want of sufficient nourishment; or the uterine nerves, partaking of the general excitability of the whole nervous system, may induce a degree of irritability in the fibres, inconsistent with the continuance of gestation. An opposite state, however, to that of weakness may produce abortion: a highly plethoric condition of the system, or a local determination of blood to the uterus in too large a quantity, may prove the predisposing cause. Thus the tendency that women evince to abort about the time when the menses should have appeared, is accounted for by the periodical uterine hyperæmia, then existing, inducing an undue irritability of the nerves of the organ. Again, from the eighth to the twelfth week of pregnancy the fœtal members are evolved in a comparatively greater degree than during any other similar period; and its body undergoes a greater proportionate change. It has been supposed, therefore, that at this time the blood is determined to the uterus in increased quantity; and upon this principle the fact of abortion more frequently taking place at this particular time than at any other has been explained.

Of the accidental or exciting causes, some originate in the mother, and others are referable to the ovum. Those that are referable to the ovum are diseases in its own structure; and these may exist either in the body of the embryo, or in some part of the appendages. In Plate 23, fig. 4, is delineated an ovum, whose coats are thickened, while the funis is œdematous, or contains too large a quantity of gelatine; which latter circumstance was most likely the cause of its death, by impeding the flow of blood through the vessels of the cord. Plate 89 is a specimen of what is called an apoplectic ovum, from a preparation preserved in the London Hospital Museum. In this and similar instances the amnion and chorion are raised into irregular, knobby eminences, by a quantity of blood being extravasated below them, into the substance of what is to become the placenta; or between those membranes and the decidua. But less evident and palpable causes of destruction may exist within its own system, such as some fault in the development or function of the omphalo-mesenteric vessels, or in the umbilical circulation, or indeed in any of its organs subservient to nutrition or oxygenation.

Of the exciting causes referable to the mother, palpitations and syncope are not uncommon; for they sometimes continue so long, and to such an intense degree, as to cause the death of the



child: partial separation also of the ovum from its uterine attachment will prove an exciting cause of miscarriage. If many of the fine villous prolongations, such as are delineated in figures 1 and 2, plate 23, by which the ovum is sustained, be severed from the uterus before the placenta is formed, abortion will very likely occur. The accident may be occasioned by external force —such as falls, blows, violent exercise, riding on horseback, long fatiguing walks; as well as by violent emotions and passions of the mind; as fright, surprise, anger, joy, and grief. All these have been known to interrupt the communication between the mother and the embryo. Prolapsus or retroversion of the uterus may cause premature expulsion of the ovum; so also may constipation, if it exist in such an aggravated degree as that powerful straining is required for the evacuation of the bowels. Another cause of abortion, by no means unfrequent, is excessive diarrhœa; and it has occasionally been produced by acrid purgatives; particularly those which stimulate the rectum —such as aloes. Vomiting and coughing have both been considered as liable to produce this accident, in consequence of the succussion the person suffers under the paroxysms.*

A syphilitic taint imparted to the new being from either parent may excite abortion by depriving the embryo of life. To produce this effect it is by no means necessary that either father or mother should be the [illegible] the disease in its primary state. If there be secondary symptoms lurking in the system of [illegible] or both, the ovum will be infected, and probably to such an extent as to destroy its vitality. It is the generally received opinion that syphilis in its secondary stage is not communicable directly to either sex from the other;—that the disease is not propagated unless there exist an open chancre; and this accords with my own observation. But it appears to me probable, that if a previously healthy woman conceive of an ovum tainted by syphilitic virus derived from its father, her system may become inoculated with the disease during the progress of gestation, in consequence of the close vascular connexion existing between it and herself; for it has fallen to my lot to see more than one case, in which a young woman united to a man labouring under obstinate secondary symptoms remained healthy for some months after marriage, but became the subject of the same complaint in its secondary form some time after impregnation had taken place; and I have considered that in such a case the mother derived the disease not directly from the father, but from the infected infant which she carried in her womb.

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* Plate 90 shows a healthy ovum of the natural size, of about fourteen weeks age; taken from Denman; I have introduced it here as a contrast to plate 89. The ovum, when beyond this size, is seldom expelled whole.

Other poisons, such as small-pox, existing in the mother's system, will cause abortion; and the same may be remarked of common fever and violent inflammatory affections.

Of all the exciting causes, however, the destruction of the integrity of the ovum is the most certainly followed by expulsive action. If, by any accident, the ovular membranes become ruptured, gestation is suspended, and abortion necessarily ensues. At any period of pregnancy, then, a puncture through the chorion and amnion will sooner or later occasion the premature evacuation of the uterus. Cases, indeed, are reported, in which it is supposed that a laceration of the involucra had taken place, and had subsequently become closed; the womb retaining its burden until the period of pregnancy was fulfilled. I am much inclined to the belief that, in these instances, some mistake had occurred; and error might easily arise from two, if not more, causes.

In the first place, there is sometimes observed a quantity of limpid, pellucid, and inodorous fluid, perfectly resembling the liquor amnii, effused between the two ovular membranes, and this not unfrequently in large quantity. In such case the chorion might burst spontaneously, or be punctured artificially; and, although that fluid was evacuated, abortion need not necessarily take place, because the amnion being still entire, the true fœtal waters remain in utero, and the economy of the ovum is little disturbed or interfered with. And again, occasionally the glandulæ Nabothi, situated at the mouth and neck of the womb, being in a state of activity from the period of conception to that of labour, pour out copiously a serous secretion, which may come away in gushes, and give a deceptive idea that the liquor amnii was discharged; and this is particularly likely to happen towards the close of pregnancy. We are not, therefore, to suppose that every serous discharge which may take place during the progress of gestation will inevitably be followed by expulsive action. But although we are liable to these sources of error, I am perfectly persuaded that if both membranes be broken, and the least drop of the water contained within the amnion flows away, the process of gestation is interrupted to such an extent as to insure the commencement of uterine contraction within a short time.

Prognosis.—The danger of abortion is to be estimated by many circumstances: partly by the period of pregnancy arrived at; partly by the previous state of the patient's health; partly by the quantity and rapidity of the discharge; partly by the difficulty in checking it; partly by the length of time that the patient has been suffering hæmorrhage; and partly, again, by the degree of expulsive action, as manifested by pain. The principal, if not only, source of peril is the loss of blood; and to that, consequently, our attention should be chiefly directed.

The younger the ovum, the stronger the patient's health, the less the quantity of discharge, and the less the difficulty in subduing it, the less will be her danger. But we must not overlook the state of uterine action in forming our judgment; for the more perfectly the organ seems disposed to contract, the more likely will it be to expel the ovum speedily and entirely, to empty its own cavity, to close its open vessels, and to put a stop to an immoderate discharge of blood. We may lay it down as a principle, that early abortions bring with them but little danger; yet this proposition is by no means without its exceptions. Many women I have seen suffering from the worst symptoms of hæmorrhage, under abortions of very early periods. Two of the minutest ova that I ever procured, I removed from the same patient on different occasions, in consequence of the danger produced by flooding. The first time I was called to her I found her miscarrying in the seventh week; and I scarcely ever saw a woman in so great peril as she appeared to be, recover; not only were the bed and mattress on which she lay soaked with blood, but, having run through, it lay in a pool upon the floor. She was perfectly senseless, colourless, and cold, and in a state of almost incessant jactitation, with which occasional convulsions alternated. On the second occasion, also, although she was not farther advanced than the same period, the hæmorrhage had been nearly as profuse and as rapid.

Although, however, the discharge is to be looked upon as the only symptom which need produce immediate alarm, abortions, as is well observed by Denman,* especially if repeated, may "either occasion local diseases, or the time of an abortion is an era from which we may date the commencement of some dangerous disease of the uterus or its appendages." Abortion not unfrequently also is followed by hysteritis, inflammation of the uterine veins, and some of the other inflammatory diseases of childbed.

Symptoms.—The symptoms of miscarriage may be arranged under two heads—those which precede and forebode the occurrence, and those which accompany abortion, and indicate that the process has already commenced. The first kind consists of the sudden loss of those sympathetic feelings which most women more or less experience under pregnancy, such as morning sickness, and others consequent on that state. The second kind—those which attend upon the process, and indicate that it has already begun—are similar to the first symptoms of labour, and the chief are the accession of periodical uterine pains, and the appearance of sanguineous discharge. These pains are at first referred to the lower part of the abdomen, to the back and loins, shooting occasionally down the inside of the thighs. At the beginning they are very slight, recur only at long intervals, and last but a short time. As the process advances, they become gradually more intense and longer, and the interval between each is lessened. The discharge is also very trifling at the commencement, and increases as the action of the uterus becomes more frequent and powerful. Some degree of nausea or vomiting, and perhaps rigors also, generally attend on the opening of the os uteri under miscarriage.

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* Chap. xv., sect. iv.

Treatment.—In the management of cases of abortion, three indications are to be borne in mind: the first, to prevent it occurring in those who have become habitually subject to it; the second, to check it when it is threatened; and the third, to conduct the patient safely through the process, provided it cannot be prevented or averted.

When we know that a woman is habitually subject to lose the ovum prematurely, it becomes our duty to insist upon the adoption of such a plan, immediately pregnancy has taken place, as is most likely to counteract the disposition, which the uterus has assumed, to call into action its expulsive powers before the fœtus is perfected. We shall, however, usually find this very difficult to effect; impossible, indeed, except by the greatest care and most rigid management.

The more frequently abortion has happened—particularly if it should have been about the same period of pregnancy—the more strongly will the habit have been formed, and the greater will be the difficulty in preventing its recurrence. But when this disposition has shown itself during the early weeks, if we can carry the patient safely over the period of quickening, she may usually be considered secure for that pregnancy; for she will then, in most instances, go on to the full time; so that after that epoch has arrived, we may relax somewhat in the strictness of the treatment which I shall proceed to advise.

Perfect rest and quietude of body, together with the preservation of a calm and unruffled state of mind, are absolutely necessary for success; and in these, perhaps, consists the principal part of our management. The patient must be confined to the house, and to one room, from the time she becomes pregnant until after she has quickened. It is not necessary that she should remain in bed, but it is quite requisite that her person should be kept in perfect quietude, and in the horizontal posture; and this as much for the purpose of preventing her exposing herself to any of the exciting causes of abortion, such as a fright, or a stumble, as to preserve a state of absolute and uninterrupted rest. We shall often find it no easy task to prevail on our patient, under these circumstances, to confine herself to the drawing-room, or her chamber. She will tell us that she feels quite as well as she ever did in her life; that many things connected with her domestic duties require her presence down-stairs; and she will promise not to step over the threshold, if we will but give her permission to spend an hour below daily. I think we should be wrong in the generality of cases even to allow of this indulgence; for a slip upon the stairs, a loud knock at the door, a noise caused by the falling of anything hard upon the floor, may so startle her as at once to bring on abortion. We should scarcely expect that an accident of such a grave character, and a process so complicated, could be brought about by such a simple cause; but if we bear in mind that the woman most predisposed to miscarry is the delicate, refined, and excitable female, whose nervous system is highly susceptible—and if we recollect that under pregnancy this susceptibility is so much aggravated, that slight occurrences, which produce no effect commonly, are then often the causes of much disturbance—we shall readily imagine that these cautions are not without their value.*

The case detailed in the note shows what a comparatively trifling cause will produce miscarriage in women in whom there exists a strong predisposition. We must, therefore, persuade our patient to put up with the inconvenience of this confinement, rather than run the risk of so serious an occurrence as abortion; and we may comfort her by the assurance that it will not be necessary to follow this severe system of restraint in every pregnancy; because, when the habit is once broken, there is less chance of miscarriage again taking place than if a number of successive abortions had happened uninterruptedly. Another source of consolation will also be afforded her, by our stating that, after quickening it is probable more liberty may with safety be allowed.

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* I was once consulted by a newly-married, delicate, though high-spirited woman, who had miscarried three times, and always at the same period, about the tenth or eleventh week, never having borne a child. I laid down for her the system with regard to rest I wished her to pursue,—exactly such as I have just advised. I told her she must confine herself to her bed and drawing-rooms, which were adjoining; that during the whole day she must not leave the sofa on any account; and that if she required her workbox or any other article from the opposite side of the room, she must ring for her servant to bring it, instead of going for it herself. She laughed at the idea of riveting herself so completely to one spot; and it was not until I had reasoned with her on the subject for a considerable time, by endeavouring to impress upon her mind that, in a system so predisposed to miscarriage as hers evidently was, the slightest causes would frequently occasion it; by assuring her that the oftener abortion took place, the more firmly is the disposition fixed, and the more difficulty is there in eradicating it; by insisting that even the strongest constitution will become debilitated and broken up by constant repetitions of the accident; and by calling also to my aid her feelings as a woman, that I could persuade her to pay the least attention to my advice. She then, however, told me, that in her last pregnancy her medical attendant had given her the same cautions, though he had not enforced them in such strong terms; that she disregarded them, and thought there could be no harm in taking a little walk for air; that she knew physicians always recommended moderate exercise in pregnancy, and that one day when she was crossing the street, a carriage was nearer to her than she expected; she was a little agitated, hurried to the opposite side of the way, came home, and had scarcely reached her bedchamber before she aborted. On the occasion to which I have referred above, she was carried safely to her full time, and bore a living child.

During this state of inactivity, most likely the bowels will become constipated, especially if the patient be the subject of morning sickness. This tendency must be counteracted by aperients, avoiding those of the drastic kind, especially aloes; this drug, as it is supposed to act principally on the rectum, may irritate the uterus through its contiguity with that organ, and excite in it expulsive action. Epsom salts in effervescence will be found a pleasant medicine: the Seidlitz powders, if sufficiently active, might prove equally efficacious; or should the patient have a great dislike to medicine, as is the case with most young women, stewed prunes may be given, or some of the subacid fruits that will act upon the bowels; or a little manna might be eaten daily before rising. But if a contrary state of system prevail,—which, however, is not usually the case in those who habitually abort,—should we find our patient plethoric, possessing a strong muscular fibre, suffering pains in the head; if there be present a jerking pulse, general irritability—especially if she be labouring under pain, pressure, and weight in the uterine region —we may then suppose that the system is unduly charged with blood; that there is a disposition towards too rapid a formation of that fluid during pregnancy; or that there exists a preternatural determination to the uterus; and we should best avert the threatened mischief by having recourse to the lancet, enjoining spare diet, exhibiting aperients and salines, and, at the same time, enforcing the necessity of absolute rest and the horizontal posture.

In all cases when a habit of aborting has been formed, it is quite necessary that the patient should separate herself from her husband's bed, from the period of impregnation until after that of quickening has passed; for in very many instances abortion is excited by indulgence in the marital embrace. It is also highly desirable, should abortion ensue, that the same separation should be continued for some months afterwards; that the uterus may be allowed a rest, as it were, and its nervous system be kept free from excitement. But this is a point that is not always attainable. Mr. White, of Manchester,* strongly recommends cold and sea-bathing, not only in the interval of pregnancy, but during the whole of gestation also.

It follows next, that we should give our attention to the best means of checking the progress of the symptoms, when it becomes evident that the uterus has taken upon itself a disposition to contract; or when the process of abortion appears actually to have begun. If we find the patient—perhaps after exposure to some exciting cause—suffering periodical pains in the uterus and loins, and especially if with this pain we should observe a slight sanguineous discharge, we may presume that miscarriage is immediately threatened, and it becomes our duty, both for the sake of the mother and the child, if possible to prevent it.

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* On Lying-in Women, p. 70.

Nothing is more uncertain, however, than the probability of averting abortion when such symptoms occur; in some cases we may succeed much beyond our expectation,* but in by far the greater number I think we shall fail: for if the os uteri is at all dilated,—if such a disturbance has been effected as to put a check to gestation,—nothing that art can accomplish will generally secure the renewal of those functions, which are necessary for the continuance of the process. Should there be merely periodical pain in the loins or uterine region, unaccompanied by discharge, we may consider that there exists a very good chance of pregnancy being carried on, provided proper means be applied with proper diligence; because the pain under such circumstances need not be the effect of uterine action, but occasioned by spasm of the lower bowels, or some irritation existing in the intestinal canal; or it may be simply a spasmodic affection of the psoæ or external muscles of the back, induced by fatigue or over-exertion. But if with this kind of pain there be also a sanguineous discharge from the vagina, we have then reason to believe that the blood flows as a consequence of the separation of some part of the ovum from its uterine attachment, and that the pains are those of uterine action. However violent or frequent the paroxysms of pain, I should entertain a better hope of preserving the ovum if there were no discharge, than I should venture to do if the flow of blood was at all profuse, although the pain might be trifling. In proportion, indeed, to the quantity of blood lost, will in general be the chance of abortion taking place.

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* Baudelocque (parag. 2232, transl.) mentions three instances in which premature labour was averted, and the patients carried on to their full time, although the os uteri was dilated to a size larger than half-a-crown when he was called. I have known the os uteri acquire the same size at about the period of seven months, and yet the patient to be carried on to the natural term. It appears to me that the uncertainty of our prognosis in regard to averting abortion in early pregnancy depends more upon our ignorance of the condition of the ovum, than upon any knowledge we may acquire of the state of the mother. It is seldom that we can assure ourselves whether the young embryo be still living or not. If it be alive, Nature may be expected to make an effort herself for its preservation;—if it be dead, she will use her best efforts to free the uterus from its now extraneous and intolerable burden.

Under this state of things, something more is required to be done, beyond what is necessary when our object is merely to ward off the danger when more remote. Quietude, and the horizontal posture, however, are here equally, if not in a higher degree, useful and requisite. The patient then must be immediately ordered to bed, every source of excitement must be removed, noise and bustle in her chamber must be avoided; in her diet she should be restricted to bland, cool, and acidulated fluids and fruits; she must breathe a moderately cool atmosphere; and opium, or any other anodyne preparation, combined with a mineral acid, may be given, in small doses, at short intervals. In addition to these measures, if the arterial system be acting with undue power—if there be much excitement and irritability—if there be present a feverish state of system—if, in short, there be reasonable grounds to regard the bleeding as of an active rather than a passive character—blood-letting, mild purgatives, and salines, will prove advantageous. As a principle, however, in this metropolis the abstraction of blood by the lancet is seldom required under threatened abortion.

But we will suppose, that in spite of a strict attention to the method proposed, the pains, instead of becoming less in frequency and power, are gradually on the increase, and the discharge is augmented also; we must then, I fear, give up the hope of saving the ovum; we must leave off the exhibition of opium, and direct all our efforts to conducting the woman with safety through the process. In a few hours, most likely, the ovum will be expelled, —whole, if it be within the first three months,—the cyst broken, if beyond that time; and the placenta will in that case come away subsequently. During the whole of the process it should be the medical attendant's study to sustain his patient's spirits, and to dispel apprehension. In lingering cases of abortion, even when there is no present danger, there is often great despondency; and this, if allowed to take root in the mind, cannot but act injuriously upon the system.

When the process is completed, we must confine the patient to the recumbent posture for a week at least after delivery; and this for the same reason that we enjoin confinement to bed after labour, lest a subsidence of the womb, or other disastrous consequences, should follow the expulsion of its contents. So long, indeed, as any bloody or serous discharge continues, there is evident proof that the organ has not regained its small unimpregnated condition, and so long the horizontal position should be sedulously preserved. This necessary caution is too often neglected after miscarriage; and prolapsus uteri is therefore in this town more commonly the result of premature expulsion of a young ovum, than of labour at the full period.

Abortion with hæmorrhage.—We have just learned that occasionally, though certainly rarely, hæmorrhage, to an alarming extent, accompanies even early abortions; and when this happens, we must pay no regard to the preservation of the ovum, both because the mother's life is placed in hazard, and because the probability is that the embryon has already ceased to exist. Under these circumstances, then, our entire attention must be devoted to the woman's safety, to moderating the discharge, and insuring the entire evacuation of the uterus as speedily as possible.

With the view of staying the loss of blood, those means must be employed which are found useful in subduing uterine hæmorrhage under all its varieties; we must enjoin absolute rest in the recumbent position; apply cold and astringent lotions to the lower parts of the abdomen, the vulva, loins, and thighs; allow the patient to breathe a cold air; administer cold and acid drinks; and avoid all hot and stimulating fluids. It would be also right that we should make an examination per vaginam, to ascertain the state of the os uteri, and if we can accomplish it, the situation of the ovum as well; for we may find the mouth of the womb open, and the principal part of the ovum protruded through it into the vagina, but still partially attached to the uterine membrane by its vascular connexions. Under such a state of things, by introducing one or two fingers of the left hand within the uterus, behind it, we may be able to perfect that separation which Nature had failed in doing; we may, without much difficulty, and with no injury, scoop, as it were, the ovum out, and thus give an opportunity to the uterus to close its cavity completely. The hæmorrhage will then cease, and the danger from that source will be consequently dispelled. I trust I need not add the caution, that in thus acting all violence must be studiously avoided; for the uterus must suffer under any attempts not made with gentleness; we must avoid, also, breaking the membranous involucra; for the young ovum is both expelled naturally, and removed artificially, much more easily and completely when entire, than when disrupted. I am much averse from the employment of any kind of tenaculum for the purpose of facilitating the extraction of the ovum, both on account of its liability to transfix or scratch the os uteri, and because the ovular membranes must be perforated and torn by its use, and portions of them will probably be left within the uterine cavity. I am quite persuaded, indeed, that a moderately large substance is expelled from the womb, not, perhaps, with less suffering, but more completely and more certainly, than a minute body; and this is one reason why I think it desirable, in abortions of the early weeks, that the ovum should be carefully preserved entire. A pair of slender forceps, such as Dr. H. Bond of

Philadelphia has recommended,[*] and which some of the French physicians think useful, might, perhaps, be had recourse to with advantage; but the finger is the best instrument that can be used, provided it will answer the object intended.

But the ovum may not have passed sufficiently into the vagina to allow of our surrounding it by the finger, or the os uteri may not be open enough to admit its introduction; manual means, therefore, to further the emptying of the cavity, are perfectly out of the question, and we must trust to more tardy and less direct agents. If the hæmorrhage have not been to such an extent as to bring the woman's life into immediate peril,—independently of the other medicines and auxiliary means already spoken of,—we may administer the ergot of rye, in the doses heretofore recommended.[†] I have seen many instances of hæmorrhage under abortion, in which I am sure this drug excited the uterus to more speedy and efficient contraction than would have happened had it not been employed.

Still, however, we may meet with cases in which the immediate emptying of the uterus artificially is impossible, yet where the flooding is so profuse as to render delay most hazardous, and where time is not afforded for the action of any medicine, however powerful it may be. In such, our object should be directed towards moderating the discharge by mechanical contrivances; and we shall find the introduction of a plug into the vagina the most effectual. A piece of sponge, or lint may be passed up, or what is better, and always at hand, a silk or cambric handkerchief, soaked in oil, may be worked into the canal until either the whole of it is included, or the organ will contain no more;[‡] what remains outward may then be cut off, on a level with the external parts, to prevent its being drawn out by becoming entangled with any portion of the dress or bed-covering; and it may be left there a shorter or longer time, according to circumstances. If it puts a stop to the bleeding, if it produces no distress, and if the uterus continues inactive, it may be allowed to remain from twelve to twenty-four hours, before it is removed, the urine being drawn off in the meantime by the catheter, if needful. But should its presence have stimulated the uterus to strong action, it may be withdrawn much within that period, in the expectation either that the ovum may be thrown off naturally, or that it may have descended sufficiently low to be extracted by the fingers without difficulty. In no case would I permit the time of its remaining in the vagina to exceed thirty hours, because putrefaction of the fluids entangled in its folds will take place, and this must occasion considerable annoyance, if not danger, from absorption. The French, indeed, by whom the *tampon* is much used, withdraw it two or three hours after its introduction; but I think in so acting, we should expose the patient to the chance of a renewal of the bleeding.

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[*] Amer. Journ. of Med. Sciences, April, 1844.

[†] Page 208.

[‡] Dewees, parag. 1000, recommends, as the best plug, a sponge soaked in vinegar. I should be fearful that such an application might induce subsequent inflammation.

The plug is often very inefficiently employed. I have frequently known two or three pieces of sponge of the size of a shelled walnut passed into a vagina, capable of receiving a man's hand, to act as a plug for the purpose of restraining hæmorrhage, when the blood has escaped by its side, with as much freedom as if it were not there. To be of service the canal must be *completely filled* by it; and sometimes two ordinary cambric handkerchiefs will be required for this object.

In the majority of cases the *tampon* gives no pain, and scarcely any inconvenience, unless, indeed, the introduction ot the catheter should be required; but in some instances we shall find the vagina so irritable, that its presence will not be endured. Advantage may then be derived from the application of a napkin, closely folded to the vulva, for two or three hours together, with the use of some degree of pressure: as a substitute this may be tried, but it is by no means so efficacious as the internal introduction. It is only, however, in early miscarriages that the *tampon* should be resorted to; it is inadmissible in floodings at the close of gestation, except, perhaps, under placental presentation, because the uterus is then so distensible as to be capable of containing sufficient blood to destroy life, although none may escape through the vagina; and the same observation applies, in a modified degree, to abortions of an older date. I should limit its use, then, to the period prior to quickening, or but a little beyond, about the close of the fifth month. At that stage of pregnancy the uterus is not evolved to such an extent as to contain enough blood to make a great impression on the system, and its fibres are too rigid to admit of much distension. As there exists, then, no cavity in which the blood can be collected besides the uterus and vagina, and as the uterus will not allow its capacity to be much increased, it necessarily follows, (provided none is escaping externally, and the vagina be thoroughly filled with the plug,) that the use of that means must be highly valuable in retaining the vital fluid within the maternal vessels.

It may be necessary, when there is great depression, to have recourse to stimulants. The indications for their use are exactly such as have been on a former occasion brought before the notice of the student when hæmorrhage under labour at full time was discussed; and they must be exhibited with equal caution. In regard to any specific medicine given with the view of checking the flow, when profuse, I think we should be as blameable in trusting exclusively to any as we should be under hæmorrhage at full time. The mineral acids may be given in conjunction with the ergot, or alum may be added. I have never seen any beneficial influence produced by the acetate of lead, though spoken of in terms of approbation by Dewees* and Conquest.†

I would strongly advise the young practitioner, whenever he is called to a case of abortion, whether it be accompanied with much hæmorrhage or not, carefully to examine for himself any solid matters that may have escaped from the vagina, that he may ascertain if the ovum has passed; not only because of the satisfaction such knowledge must bring both to himself and his patient, but because it will much influence his treatment. A superficial examination, however, will not be sufficient; the coagula must, one by one, be broken down between the fingers; for the external surface of a young ovum, when covered by the investing decidua, so much resembles a firm piece of clotted blood, that it can only be discriminated by the discovery of its proper membranes, or the embryo within them.

Thus, then, it will be perceived, that in abortions attended with hæmorrhage, our sole anxiety is for the well-being of the mother; and as the chief danger arises from the discharge, we must endeavour to restrain it—first, by the measures ordinarily had recourse to; if they fail, we remove the ovum by the introduction of two or more fingers within the os uteri, provided that be practicable; should this, however, be impossible, we plug the vagina, or exhibit the ergot of rye, or use both means at the same time.

It may happen, however, that the ovum may break,—that the fœtus may be expelled, and the placenta retained for days, weeks, and perhaps months. It is remarked, indeed, that in general the placenta of a young embryon is retained much longer than one belonging to a perfect fœtus; and so long as there is any portion of that mass in utero, so long the woman is not safe from flooding, and so long she is liable, also, to other dangers, more remote, but by no means despicable. It is, therefore, highly desirable, that when the embryon has passed, the placenta should be removed as speedily as possible; but this cannot be effected by the agency of the funis, for the cord is so tender that the least straining will cause it to break. We shall be equally unsuccessful in any attempts we may make to get it away by the introduction of the hand: for the uterine cavity is not large enough to admit the passage of the hand within it. Unless, then, it be lying partly in the vagina, so that we can embrace it between two fingers and draw it away, we must rely on those means best calculated to prevent hæmorrhage, including the plug, and give the ergot of rye, in the hope of exciting the uterus to such efficient action as will eventually throw it off. Dewees* recommends a small wire crochet in such cases to be carried within the uterus, even up to the fundus, and drawn slowly downwards, by which means the placenta is transfixed and extracted; and he says he has used it with great success. The instrument appears to me to be dangerous, since we cannot protect its point while within the uterine cavity; and it is as likely to fix itself on the internal membrane of the organ, as on the placenta. Dr. Bond's forceps might be advantageously used, if the placenta were partially protruded through the mouth, though not sufficiently low to be removed by the fingers; but I would as strongly object to their being introduced within the cavity, as I would to Dewees' hook, and that for nearly the same reason; because of the probability of injuring the maternal structures. Streeter† advises the uterus to be washed out with tepid water by means of one of Reid's syringes, which might be serviceable, especially if the discharges were fœtid.

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* Mid. parag. 999.

† Outlines of Mid. p. 53.

As I remarked in regard to the entire ovum, an early placenta does not always undergo the putrefactive process, although that of a child at full time, or near it, invariably becomes putrid within twenty or thirty hours. What is the reason of this difference I cannot say; but I have known a number of instances in which the placenta was not thrown off for many days after the young embryon had passed, and yet it did not possess in any degree a putrid odour.

Premature labour, and all those cases which occur during the last three months of utero-gestation, must be treated in every respect according to the principles that have been already laid down for the management of the various cases of labour: for we may consider it as a general rule,—certainly not without exception,—that when six months and a half or seven months are perfected, the hand may be introduced fully into the uterus, and any obstetric operation performed, which the urgency of the case may demand.

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* Parag. 1010.

† On Abortion, p. 59.

APPÆNDIX.

APPENDIX.

A.

Origin of the term Sacrum.—The origin of the name Sacrum, as applied to this bone, has given rise to much conjecture; and although it has occupied the attention of many learned men, it is still involved in obscurity. That it was of very ancient date, is evident from the term *ἵερον ὄστεον,* used by the Greeks, even prior to the time of Hippocrates.

By some moderns, as Fyfe and Campbell, it is supposed to have been adopted from this particular bone, or the parts connected with it, having been burned as a votive offering in the sacrifices of the ancients, or otherwise dedicated in a special manner to the Deity sought to be propitiated. The only ground for such a supposition that I have been able to trace in the classical writings, is the following line of Menander —*ὁι δε τὴν ὄσφυν ἄκραν θυσάντες*; *but they were sacrificing the lower parts of the loins;* which, indeed, is cited by Stephens, in his Thesaurus, as the authority for this idea. But Menander's works have come down to us in such disjointed fragments, so mutilated and corrupted, that we cannot rely on any passage as genuine, especially when, as is the case here, one line only of a sentence is preserved, without context, either preceding or following; and had the erudite Stephens been able to adduce a quotation from any other author of repute, he would certainly not have preferred Menander. It is well known, indeed, that in the earlier heathen sacrifices, the whole of the victim was reduced to ashes; and that in the latter ages, when the priests, through their necessity or cupidity, reserved the edible parts for themselves and their followers, the entrails only were consumed; and no part of the skeleton seems to have been preserved or held more sacred than the rest, with the exception of the skull, which was sometimes nailed up in the temples, and was eventually adopted as an architectural ornament. Hesiod (*Θέογονια,* v. 521—560) represents Prometheus as having offended Jupiter, by innovating upon the practice of offering the whole animal, and reserving the best part of it for food. (See also Hyginus, in his Astronomicon Poeticon, ii. 5, for the same fable; and consult Saubertus de Sacrificiis veterum, pp. 232 and 430.) The Jews also, in their chief sacrifice of expiation, "the Holocaust," or "the whole burnt offering," consumed the entire animal by fire upon the altar; and no part of it was either eaten or preserved.

Others presume the name to have been derived from its size, being the greatest bone in the spine. (Parr's Dictionary. Monro on the bones; Plat. x. 83;) and the term *ἵερα συρὶγξ* (Pollux), employed to designate the spinal canal, might perhaps favour this notion; though it would also bear the signification hidden or secret. Rufus Ephesius, the principal Greek authority on anatomical names, says this bone is so called from being the largest in the vertebral column: *ὃ γαρ ἵερον ὀστοῦν καλοῦμεν συνήθως τών ἀρχὰιων ἵερα τὰ μεγάλα καλοὺντων.* *We call it the sacred bone, after the ancients, who called large things sacred.* (De appellat. partum corp. human. lib. iii. c. 4.)

Others, again, (Hooper,) from its supporting the organs of generation, which were held sacred, or from the belief that it performs some sacred and mystical office in labour, "quod in eâ aliquid sacri arcanique insit;" since it was supposed to open and separate from the other bones by a divine power inherent in itself, and after the birth of the child to become again consolidated, "miro quodam naturæ opificio."

Scheller, in giving the definition "secret" as well as "sacred" to sacer, quotes, as an instance of this employment of the term, Cœlius Aurelianus; who states that the "os sacrum" is so called, "quod imum ventrem sustinet!"

All these derivations appear to me to be too fanciful and improbable; and I think we may trace the term *ἱερον* in connexion with this bone to an age even more remote than the earliest period of the Grecian empire. הֵרוֹן Herūn or Herōn, in the original scriptural language, signifies conception, gestation, and the process of parturition. (Genesis iii. 46; Ruth iv. 13; Hosea ix. 11.) From the root of that word, הָרָה hērē, to conceive, it seems to me by no means improbable that the Greeks derived their appellative of Juno *Ἥρη* "veluti præses nuptiarum," who presided over marriage and childbirth; which latter office, also, was the peculiar province of the Juno Lucina, of the Romans. *Ἥρη* has, indeed, usually been derived from *ἔραω*, to love, *ὡς ἐράτην τινα*,—as being an amiable personage; but, putting out of the question that the poets did not paint Juno's character in the most amiable light, the very rare circumstance of an asperated word having for its root an unasperated one, would lead to the belief that such a derivation was incorrect. The palpable and easy derivation of the genitive and other cases of "Jupiter" by the Romans, "Jovis," &c. from יְהוָֹה "Jehovah," would strengthen such an idea.

Through the frequent and intimate intercourse which was held from the remotest time between the Jews and all the other civilised nations of the world, we may readily conclude that the Greeks were well acquainted, not only with the Jewish superstitions, but also with their familiar phrases. If we grant this, we may as readily imagine that they were acquainted with the Hebrew word הֵרוֹן Herōn, as indeed I consider their own appellative *Ἥρη* proves. Thus, this bone would be called *ἥρον ὀστεον*, as being the part where the pains of labour were principally felt; and by a very slight change of pronunciation, a most easy and natural transition, or by the ignorance of transcribers, the *ἥρον* would be corrupted, and slide into *ἱερον*, especially as this latter word was one in very common use with them; and more particularly, since we have good reason to believe that the ancient Greeks, as the moderns, pronounced the *ἱ* as the Italians do the letter *i*; which would approximate the sound of the Greek word more closely to that of the Hebrew. In this manner it would acquire the name *ἱερον ὀστεον*; and the Latins translating it, would retain the Greek phrase, without knowing how it originated. If this be true, the *ἱερον ὀστεον*, os sacrum, will signify no more than the bone intimately connected with the internal organs of generation, or chiefly affected by the throes of parturition.

It is worth remarking, that a curious superstition connected with the sacrum or coccyx, sprung up among the Jews soon after the Christian era, and became one of the Rabbinical doctrines; viz. that part of the skeleton would resist decay, would remain unchanged, and become the germ from which the body would be raised in the resurrection. The bone invested with this restorative power was called the לוּז luz, and was the lower part of the spinal column. Thus, Buxtorf, (Lexicon Chaldaic. Talmud. et Rabbin. col. 1129,) "Lus, nomen ossis cujusdam in corpore humano, quod scribunt Hebræi esse incorruptibile, ac propterea, ejus beneficio futuram totius corporis resurrectionem." For which he quotes several Rabbinical authorities, giving Latin translations: "Lus est os spinæ dorsi in homine, quod non comburitur, neque corrumpitur in perpetuum." "Lus est os parvum in fine vertebrarum; totum corpus putrescit, excepto isto osse." "Lus vertebrarum, unde Deus regerminare faciet hominem in futurum," &c.

Butler, in his celebrated satire, has pleasantly introduced this superstition:—

> "The learned Rabbins of the Jews
> Write there's a bone, which they call luz,
> I' th' rump of man, of such a virtue,
> No force in nature can do hurt to;
> And therefore, at the last great day,
> All th' other members shall, they say,
> Spring out of this, as from a seed
> All sorts of vegetals proceed;
> From whence the learned sons of art
> *Os sacrum* justly style the part."
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> HUDIB. Canto ii. Part. iii.

In a very ancient Hebrew exposition of the Holy Scriptures, known by the name Medrach Rabbath, treating of the Deluge, we read (p. 28-6,) on the authority of Rabbi Simeon, son of Yoradek, the destruction was so complete, that not even the luz, from which man was to be restored at the resurrection, was saved; for the Almighty would not preserve a vestige of the race then existing, except Noah and his family. It goes on to say, that Rabbi Joshua, son of Haninah, being desirous of proving to the Roman emperor Adrian the truth of the resurrection, took a luz, and "attempted to grind it in a mill, but it would not be ground; to burn it with fire, but it would not be burned; he put it in water, and it was not destroyed; he placed it on an anvil, and began to strike it with a hammer, but the anvil was split, and the hammer burst asunder without it diminishing aught." Had this superstition arisen prior to Hippocrates' time, we might suppose that the Greeks borrowed from it their term *Ἱερον ὀστεον*, in consequence of the presumed incorruptible nature and holy function of the bone after death. But as this fable cannot be traced farther back than the age of Adrian, who lived in the second century, such a supposition of course falls to the ground. לוּז luz, is one of the Hebrew words for an almond or an almond tree; and the phrase, "Os parvum in fine vertebrarum," would evidently imply the coccyx. The coccyx, then, might have been so named from its supposed resemblance to an almond, being slender and pointed. But it is probable that this term was applied either to the sacrum or coccyx, or both of these bones conjointly. Now the Jews adopted the almond tree as an emblem of haste and fertility, from the rapidity with which it brought its fruit to perfection (Jer. i. 11-12, also Ecclesiast. xii. 5.) From the figurative character of the Hebrew language, it is easy to suppose that the word used as the symbol of fertility might be transferred to any of the organs connected with the process of reproduction. Indeed, Mendelsohl, in translating the passage in Ecclesiastes, to which I have referred, takes the almond to signify the ovary. The very name לוּז, therefore, applied by the Jews to the sacrum or coccyx,* seems to strengthen the idea I have formed of the origin of *Ἱερον* in connexion with the first-named bone.

The Arabians held the lower portion of the spine in similar veneration. Sale, in the learned discourse prefixed to his translation of the Koran, (edit. 1821, p. 104,) says, "Mahommed has taken care to preserve one part of the body, whatever becomes of the rest, to serve for a basis of the future edifice. For he taught that a man's body was entirely consumed in the earth, except only the bone called al ajb, which we name os coccygis, or rump-bone; and that, as it was the first formed in the human body, it will also remain uncorrupted till the last day, as a seed from whence the whole is to be renewed."

Os Basilare is evidently derived from *βασις*, a step, the foot, a pedestal or support.

B.

Anæsthesia in Surgery. — *History.* — In the works of Dioscorides, Pliny, and Apuleius, as well as some other of the ancient philosophers, there are to be found formulæ for the preparation of drinks, for the purpose of deadening pain under the surgeon's knife; and in those of Theodoric, of the thirteenth century, a "scent," called "*spongia somnifera,*" is described, formed of a strong decoction of soporiferous vegetables. In this decoction a sponge is to be dipped and held to the nose of the person to be operated on, until he has fallen asleep; and while he is in this state, the operation is to be performed. (Monthly Journal of Medical Science, Edinb., 1848, vol. viii. p. 451.)

In more recent times, many philosophers have made observations on the respiration of different kinds of airs for medicinal and other objects. Thus, in Fontana's Papers (Phil. Trans. 1779, vol. lxix. pp. 346-7), there is an account of experiments made upon himself, by breathing hydrogen gas; as well as remarks on the effect of other descriptions of elastic fluids on man and other animals.

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* According to strictly correct etymology, the word *coccyx* should be spelled with a double *k* instead of a double *c*, being derived from the Greek *κόκκυξ*; but as two *k*'s never follow each other in any English word, as it would be equally incorrect to spell it with *ck* as with *cc*, and as the alteration in spelling would necessarily completely change the pronunciation usually adopted (which in anatomical phrases is very undesirable), I have preferred retaining the ordinary mode of writing it. In all other cases, indeed, through this edition, where our word is derived from a Greek one, with a *κ* in it, I have rendered the English by a *k*, rather than by a *c*, as in *akephalic*, which assimilates the derivative more nearly to the original.

Dr. Rd. Pearson, of Birmingham, seems to have been the first to apply the vapour of *sulphuric ether* to medicinal purposes; and this was chiefly in phthisis and other diseases of the respiratory organs. He combined it with cicuta by macerating a sufficient quantity of the dried leaves of the plant in the ether for three or four days. (See his communications in Duncan's Annals of Medicine, 1796, vol. i. p. 401; also Simmond's Med. Facts and Observations, vol. vii. p. 95.)

Dr. Beddoes (Considerations on Factitious Airs, Bristol, 1795-6,) publishes several communications from Dr. Pearson on the inhalation of ether, and in part 3rd, p. 40, a letter from one of Dr. Thornton's patients to that physician, in which he describes the consequence following the inhalation of ether on himself, while suffering from a severe attack of bronchial inflammation; in a subsequent work, (Contributions to Physical and Medical Knowledge, 1799, p. 346,) a letter also from Dr. Caleb Crowther of Wakefield, where an account is given of the inhalation of the same vapour by a female, in an attack of acute pulmonary catarrh, apparently with great advantage.

But to Sir Humphry Davy, among the moderns, we owe the first application of any gas by inhalation, decidedly and specifically for the relief of pain of an ordinary character; as also the first suggestion of its applicability to the removal of suffering under surgical operations.

While Sir Humphry was assisting Dr. Beddoes in his experiments on the gases, he published, in 1800, his "Researches on Nitrous Oxide;" and at p. 464 he says, that on two occasions he removed head-ache in his own person by breathing this gas; in the next page he gives us an account of relieving the pain consequent upon cutting one of his *dentes sapientiæ*, by the same means. Further on, at p. 556 of the same philosophical work, there are to be found these remarkable and memorable words: "*As nitrous oxide in its extensive operation appears capable of destroying physical pain, it may probably be used with advantage* DURING SURGICAL OPERATIONS, *in which no great effusion of blood has taken place*." So that, to our celebrated countryman is really due the merit of suggesting what has within the last few years been so extensively adopted. Again Nysten (Dict. des Sciences Medicales, vol. xiii. p. 385, published in 1815) speaks of the *vapour of ether* as familiarly known for the relief of some pulmonary complaints, and for the *pain of colic*.

It would be supposed, after the publication of those clear and unmistakeable remarks, that the application of ethereal inhalation for the purpose of destroying sensibility, and deadening pain under surgical operations, would have been speedily adopted, as the step seems so easy and natural; and that no one in our days would have laid claim to the suggestion as its discoverer. This was, however, not the case; the hints were disregarded—the theory was not reduced to practice:—and both Dr. Jackson, the lecturer on chemistry, and Dr. Morton, the professional dentist, have lately come forward, as arrogating to themselves the sole merit of the invention.

Dr. Jackson, in a letter published in the Boston "Daily Advertiser" for March 4th, 1847, says, that "*being early impressed with the remarks of Sir Humphry Davy, concerning the remedial agency of gaseous matters*," he tried the effects of the ether vapour upon himself; and about the end of September or the beginning of October, 1846, communicated his discovery to Dr. Morton, and recommended its use to him in his profession. He states that Dr. Morton, having a refractory patient, applied to him for an india-rubber bag to fill with atmospheric air, which he might induce her to respire, under the plea that it was some medicated vapour that would take away all suffering; that he dissuaded him from his project, and explaining to him that he had discovered a process by which insensibility to pain might be produced, gave him some sulphuric ether; and this really had the effect that was desired.

Dr. Morton, as is stated in the text, afterwards exhibited ether at the Massachusetts Hospital, during a capital operation; and thus his name has been connected with the history of this discovery.

Immediately that the above-mentioned letter from Dr. Jackson was given to the world, Mr. Horace Wells, of Hartford, Connecticut, being desirous of himself wearing the laurels, which he considered as his own, entered the field as a competitor for the prize.

This gentleman, in the year 1847, published a small pamphlet, at Hartford, entitled, "*History of the Discovery of the Application of Nitrous Oxide Gas, Ether, and other Vapours to Surgical Operations.*" In this pamphlet he says, he was led to believe that surgical operations might be performed without pain, by the fact that an individual, when much excited from ordinary causes, may receive serious injuries without manifesting the least indication of pain, as in the case of a man being wounded in battle without knowing it;—and also that, when deeply intoxicated, a person may be severely treated, with the like insensibility to suffering.

From these considerations he was led to inquire whether the same results would not follow the inhalation of some *exhilarating gas*, the effects of which would rapidly pass away, without leaving any bad consequences upon the system.

He therefore procured some nitrous oxide gas, and inhaled it himself, by way of experiment, previously to having a tooth extracted; which operation was performed without causing him the least pain. He afterwards took out teeth for twelve or fifteen other persons while under the influence of the gas, in an equally painless manner. This was "in the fall of 1844."

Being a resident in Hartford, he proceeded to Boston in December of the same year, in order to present his discovery to the medical faculty. By invitation of Dr. Warren, he addressed the Doctor's medical class on the subject. He also mentioned his discovery to some gentlemen in Boston, among whom were Drs. Jackson and Morton; and it was agreed that an experiment as to the value of the new practice should be tried in the presence of several members of the profession. The gas was administered to a man before the extraction of a tooth; but the "gas-bag being removed too soon," insensibility to pain was not produced; the whole was denounced as an imposition; and no one was inclined to assist Mr. Wells in further experiments. The disappointment brought on a fit of illness, and he returned to Hartford.

Dr. Morton, living at Boston, had been a pupil of Mr. Wells, and, as the latter gentleman avers, he came to Hartford some time after, to request Mr. Wells would instruct him how to prepare the gas which he had been giving so successfully at Hartford, that he might make a trial of it at Boston. Mr. Wells referred him to Dr. Jackson, also of Boston, as he was a chemist, "who gave him *ether* instead, as being attended with less trouble."

After "one or two teeth" had been extracted, under the influence of ether, it was introduced into the Massachusetts' General Hospital, where a capital operation was performed by its assistance with complete success. This fact was immediately published in the newspapers of the day, with the names of Jackson and Morton as the discoverers.

Mr. Wells further states, that at the end of the year 1844, he and Dr. Marcy had many discussions together, respecting the comparative merits of nitrous oxide and sulphuric ether; that, in November, 1844, an operation was performed "in Dr. Marcy's office," under the influence of sulphuric ether; and that the Doctor then advised him by all means to continue to use nitrous oxide gas. This statement is confirmed by Dr. Marcy, on affidavit before A. M. Collins, mayor of Hartford. Indeed, appended to the pamphlet there are numerous affidavits, as well from physicians who had conversed in 1844 with Mr. Wells on his discovery, as from persons who, in the same year, had been the subjects of operations on the teeth, after having inhaled the gas, sworn before magistrates, and countersigned by them in due form. So that, as Dr. Morton's first trial was on September 30th, 1846, according to the pamphlet in question, the priority of the practice of *using* exhilarating gases to deaden pain *under a surgical operation* must be conceded to Mr. Wells; and the fact being established, it matters not at all what the agent used is;—the application of one gas or vapour instead of another, forms merely a variation of detail, and does not affect the principle on which the experiment was founded.

Another claimant sprung up in the person of Dr. Collyer, of St. Helyer's, Jersey, who, in a communication to the editor of the British and Foreign Medical Review, (which was forwarded for publication to the Medical Gazette, and will be found in the number of the latter work for January 8th, 1847, p. 82), states, that in 1843 he published a work on the subject, wherein he "distinctly and unequivocally declares *that the unconscious or congestive state may be brought about by the inhalation of narcotic vapours.*"

But granting that Dr. Collyer did not borrow his ideas from any foreign source, they cannot be admitted as original contributions to medical science, after the observations above quoted, especially those of Beddoes, Pearson, Davy, and Nysten.

C.

ERGOT OF RYE.—*History.*—Although this medicine has only been had recourse to recently by practitioners, to increase uterine action, the substance has been known to possess deleterious and poisonous qualities for more than eight hundred years; and has been employed on the continent by female midwives as a promoter of labour-pains, for nearly one hundred and fifty years. If taken in large quantities, mixed with the healthy grain, as food, it produces giddiness, spasms, and convulsions, on which gangrene and sloughing of the extremities supervene: and to this disease the name of *ergotisme* has been given. (See art. Ergotisme, by M. Renauldin, in the Dictionnaire des Sciences Médicales, tom. xiii. 1815.) Its deleterious effects were first recognised so early as the year 1089, by Sigebert de Gremblour. (Recueil des Hist. des Gauls et de la France, tom. iii. p. 259.) Wendelin Thelius, a German physician, gave an account also of an epidemic which raged in the kingdom of Hesse in 1596, attributed to this disease being so frequent in the grain. And the medical faculty at Marburgh, in 1597, published a pamphlet on the same subject. In 1648 and 1649, both Saxony and Sweden became ravaged by a similar epidemic; and twenty years afterwards the same accidents took place from the same cause in Blois and Montargis, in France. An account of this epidemic was given by M. Perault, in the Journ. des Sçavans, 1676. In 1670, the Académie Royale des Sciences at Paris became informed of singular accidents which had occurred in the district of Sologne, owing to the use of bread there, made with spurred rye. In 1777, M. Tessier witnessed the same occurrences also in Sologne, and made numerous observations and experiments, a very interesting account of which he published the same year, in the first volume of the Memoirs of the Royal Society of Medicine. Since that time, in different years, its baneful influence has been more or less remarked in France. And although some observers, as Paulet and Model, have thought that the deaths occurring at these times, in those particular districts, were caused by the great vicissitudes in weather and temperature, rather than by the diseased grain; yet the various experiments of Tessier, on animals removed out of the influence of such exciting causes, fully prove that the accidents were attributable to the grain itself. (See Tessier's Traité des Maladies des Grains, Paris, 1783.) I would refer my reader also to some instructive experiments performed by Mr. Wright, as detailed in his Essay on the Ergot, (Ed. Med. and Surg. Journal, October, 1839, and two subsequent numbers.)

For accounts of many other epidemics that ravaged different parts of the European continent, between 1659 and 1741, a Latin letter from M. Tissot to Dr. Baker, in the 55th vol. of the Philosophical Transactions, 1765, p. 108, may be consulted; as also Mr. Wright's paper, just noticed. Mr. Wright has proved by sundry experiments, that the active principle of the ergot resides in an essential oil, which can be separated by distillation. (Ed. Med. Surg. Journal, July 1, 1840, p. 53.)

Like many other valuable medicines, the knowledge of this substance was for many centuries entirely confined to its poisonous qualities; and even those who had studied its history in the closest manner were ignorant that it could boast any other. Of spurred rye, first mentioned for its noxious effects in 1089, no notice occurs, as an uterine remedy, till 1688, when R. J. Camerarius stated, that in some parts of Germany midwives were in the habit of using it to accelerate parturition. (Acta Naturæ Curiosor. Centur. vi. Obs. 82, An. 1688; see also Dierbach, Neuest. Entd. in d. Mat. Med. p. 130, 1837.) No author, however, mentioned it for this purpose from that time till 1774, when Parmentier, in a brief letter to the Abbé Rosier, in the fourth volume of the *Journal de Physique,* made known that it was frequently used by Mad. Depille, a midwife at Chamont, as a child-bed remedy.

This letter merely announced the simple fact; it was to M. Desgranges, an able obstetrical practitioner at Lyons, that we are indebted for rescuing this medicine from the hands of the women. He, in 1777, having met with many females who, from a traditionary knowledge, were accustomed to employ it with no little mystery, in cases of lingering labour, made some trials with it himself, and published in various journals, at different times, the result of his practice and observations. (See an able article by Desgranges, in the Nouveau Journal de Med. Chir. et Pharm., Janvier, 1818, tom. i. p. 54; also Gazette de Santé, 1818—19.) The French, then, seem to have employed it first; and the American physicians were in the habit of using it many years before it became generally known in England. Both Drs. Dewees and Chapman, of Philadelphia, (Discourse on Therapeutics, &c. Philad. 1817,) and Drs. Hosack, Bibby, Prescott, and Stearns, of New York, had employed it repeatedly. (See Letter to Dr. Hamilton, on Ergot, by Dr. Hosack, New York, 1842. Dissert. on Ergot, by Oliver Prescott, New York, 1813; and Lond. Med. Phys. Journ. vol. xxxii. 1814, p. 90. And account of the "Pulvis Parturiens," New York Med. Repos. 1808, by John Stearns; also Med. Phys. Journ. vol. i. 1823, Lond. p. 55.) It was not, indeed, till the year 1820, that it attracted particular notice in this country, when the attention of the profession was called to it by Dr. Merriman (Synopsis, Ed. 3rd, 1820, p. 187) and Dr. H. Davies, (on the Secale Cornutum, Med. Phys. Journal, vol. liv. 1825, p. 100,) both of whom published some cases in which it had been tried. Since that time it has come into very common use; its powers are now universally known to the profession; and the medical periodicals of the day have teemed with the history of cases in which it has been found of service.

On its first introduction, many practitioners received with much distrust the account of its peculiar properties, published in the various journals, and elsewhere: at last, however, from the mass of evidence accumulated on the subject, they were forced to admit its powers and efficacy. They then took a different ground,—acknowledged its power, but objected to its use:—it was argued, that if it really possessed such influence over the uterus, that virtue must be obtained at the expense of the constitution; that it must act on the uterus through the medium of the arterial system; that it should be classed as a stimulant, and as such must produce dangerous excitement. This is certainly not the case, as all unprejudiced observers agree in testifying: it acts on the uterus entirely through the nervous system, not necessarily exciting the heart and arteries to increased action; its influence is specific, confined principally to the uterine organs; and the pulse, if it rises at all, is only secondarily affected, in consequence of the increased action of the uterus. In many instances it has appeared sensibly to diminish the frequency of the pulse. (Merriman's Synopsis, pp. 191—193. Trousseau and Pidoux, Traité de Therap., vol. i. p. 547; and Wright's Essay, Ed. Med. Journ. July, 1840, p. 60.) Dr. Hardy, of the Dublin Lying-in Hospital, (Dublin Journ. first series, vol. xxvii. p. 224) says that out of 48 cases in which he made observations on the administration of the ergot, in the majority of them a diminution in the pulsation of the fœtal heart followed its use, attended by irregularity; that in 19 of these the frequency of the mother's pulse was also lessened; and that this effect continued several days. He observes that few children were saved, even although speedily delivered, whose circulation fell steadily below 110 beats in the minute, *if attended with intermissions.* Although I have known the maternal pulse depressed by the drug, I never knew that state continue for any length of time; nor in a single case did I ever observe any permanent evil inflicted on the mother's system, consequent on its absorption.

The danger therefore to which the child is exposed from its use was urged as an objection against its administration. It is well known that some drugs, antimony and opium, for example, produce an influence over the system of the fœtus in utero. Of this fact I have myself had an opportunity of seeing some examples, and one of a particularly striking character. A lady, in consequence of suffering severe pains during the last few weeks of pregnancy, was in the habit of taking opium to a considerable extent, until the accession of actual labour; her children, on such occasions, were always expelled in a drowsy, stupid, almost comatose state, which continued for some hours after their birth. If opium is capable of producing such an effect upon the fœtus, it is not unreasonable to believe in the possibility of the ergot also being able to produce an injurious influence in a similar manner; and as in many cases where the ergot had been taken the child was born dead, this misfortune was attributed to its having been poisoned by the medicine exhibited to the mother. (Huston, North Amer. Med. Surg. Journal, January, 1829; Hosack, Letter to Hamilton, Moore, Holcombe, Letter to Dewees. See also Lond. Med. Phys. Journ. vol. vii. p. 181, new series, August, 1829.) In most of the cases, however, which were adduced as proofs of this fact, the labour had been very lingering, and the child had probably been destroyed, not by any poisonous quality resident in the drug, but by pressure either on the fœtal head, during its passage through the pelvis, or more likely on the funis umbilicalis. I have myself seen a great number of cases in which many doses of the ergot were given where the children were born alive; and therefore I am fully warranted in saying that the drug does not *necessarily* destroy the fœtus. Nevertheless I am well convinced that it will often act injuriously on the child, provided it be given for a length of time together, and provided also it produces its specific effect on the maternal system. For, as I have stated in the text, after I had commenced the practice of giving the ergot for the purpose of bringing on premature labour, I was much disappointed in finding that a greater proportion of children was born dead than when I had recourse to puncturing the membranes for the same object. I could not but believe that the drug was the cause of this calamity, especially since I was so constantly informed by my patients that before the fœtal movements ceased they had been very violent for some minutes. This tumultuous action no doubt indicated a convulsive seizure, under which the fœtus perished. I have given this medicine fifty-five times with the view of inducing labour; and although thirty-three of the children were born living, five died in convulsions speedily after birth, *postquam partus prematurus inductus fuerat ope solum secalis cornuti.* This circumstance has also confirmed me in the opinion of a baneful influence propagated from the mother to the fœtus; for since one of that series of phenomena that constitute *ergotisme* is convulsive seizures, since each fœtus I have adverted to evidently perished in convulsions, since also it is a rare thing for infants to be attacked with convulsions soon after their birth, it is a natural inference that the medicine occasioned the disease in all these instances, and therefore was the exciting cause of death. When we contemplate these facts we are justified in concluding that although the ergot does not *necessarily* injure the fœtus, and will most probably do it no harm, if only a few doses are exhibited to the woman; yet, if given in large quantities, for a long time together, or without sufficient caution, it may be productive of most serious consequences. Wright's experiments on the lower animals (Ed. Med. Journ. January, 1840, p. 29) prove decisively that the medicine has a most prejudicial influence upon the young *in utero,* even to their destruction; and they would lead us also to believe that no effect is produced on the fœtus, unless the mother's system be considerably affected by it, as evidenced either by its causing uterine action, or giving rise to some other disturbance. The ergot also may be instrumental in destroying the child by the kind of uterine contractions it induces; for they are not only often preternaturally powerful, but uninterrupted and without intermission for a long continuance of time, during which there must of course be dangerous pressure on the blood-vessels in connection with the fœtal body.

Again, it was objected that the medicine, if commonly introduced into practice, would be dangerous, because it might be given in cases perfectly unfitted for its use; (Huston, North Amer. Med. Surg. Journal, January, 1829); and that contusions, inflammations, sloughings. and lacerations of the uterus, vagina, and perineum, would frequently follow its injudicious employment. It surely is neither sound logic nor fair argument to adduce as an objection against a valuable remedy, the possibility of its abuse. I would ask, is bleeding never liable to be abused, or mercury? and shall we discard these remedies because a bungler might misapply them?—Neither is this nor any other medicine to be prescribed at random; we must only have recourse to it in consequence of certain conclusions at which our mind has arrived after a system of severe reasoning.

Still another objection has been taken, stronger and more difficult to refute than any of the former;—namely, that if the medicine possesses such powers in increasing the action of the uterus, it must also possess the power of producing uterine action *ab initio;* and if such were the case, it would be little less than criminal to admit into our pharmacopœia, or into common use, any drug which might be had recourse to, both by unprincipled men and females, to occasion abortion. (Gerardin, Rev. Med. Septembre, 1824, quoted in Lond. Med. Phys. Journal, vol. lii. p. 530.)

It was a belief in its possessing this property that led Pelletier and Planche, in a report to the French minister of the Interior, in the name of the Royal Academy of Medicine, to recommend its exclusion from practice. (Wright, Ed. Med. Journ. January, 1840, p. 26.) This argument was answered by a denial; it was said that it only possessed the power of increasing the contractions of the uterus when that organ was disposed to act, and did not produce them *ab initio.* In confirmation, it was declared that in those countries and seasons where *ergotisme* was prevalent, miscarriages were not more frequent than usual, which must have been the case if ergot produced abortion. (Neale, on the Ergot, 1828, pp. 16, 57, and 78; Stearns, Op. cit. Prescott, &c.)

*Forsan hæc omnia vera;—egomet ipse tamen permulta vidi exempla, in quibus partus prematurus inductus fuit—septimo vel octavo graviditatis mense peracto—solo secalis cornuti usu; ovuli membranis integris servatis; ore uteri occluso, neque digito, neque ullo alio modo ad patefactionem excitato. Quare hoc medicamentum opinor, etiam, ab initio, partûs dolores inducere posse: et si tam insignes illi vires, appropinquante graviditatis fine, adjudicemus; similem facultatem eidem medicamini dum recens sit, exiguumque ovum, negare, absurdum esset. Haud, profecto, propter eam causam secale cornutum ab usu expellendum est. Nihilominùs medicos oportet notitiam ejus virtutis a vulgo, precipuèque a mulieribus, diligentissimè celantes, in suis pectoribus occultè ferre.**

The effect of the ergot on other animals is much the same as on the human subject; and if sufficient be given, it causes death. Mammals, birds, and insects have all been poisoned with it; but they refuse to take it, even when mixed with their food. (Pereira's Mat. Med. vol. ii. p. 601; Neale, p. 89; Wright's Experiments.) Chapman (Elem. of Therap. vol. i. p. 489, fourth edition) says, "It never fails to occasion abortion in a short time" in pregnant brutes. Combes once caused abortion by it in a bitch; Depuy in a cow; and Percy and Laurent produced the same effect, by injecting a decoction of it into the veins of a cow. (Neale, p. 91.) No effect of the kind, however, followed its exhibition in Mr. Wright's hands. Mr. Youatt, Veterinary Surgeon to the Zoological Society, has for some years been accustomed to administer it to quadrupeds, in cases of protracted or difficult parturition; and he states, that "in every case the uterus has responded;—it has been roused to a greater or less degree of action." He never knew it fail, in the *monogastric* animal, to produce considerable effect: and he gives a very feasible and scientific reason why, in consequence of the peculiar formation of the stomach in the *ruminant*, it may be given to that animal without the uterus being in the least influenced by its administration. (Pereira, loco cit.) Mr. Dick, also, Professor of Veterinary Surgery in Edinburgh, informed Mr. Wright that he had known this drug hasten labour in cows, when given after uterine action had begun. (Edinb. Med. Journ. Jan. 1840, p. 28.)

D.

FORCEPS.—*History.*—As a concise history of obstetric instruments may be interesting to some readers, I have introduced a short account of their invention here. In Aviconna's work will be found the first notice of an obstetric forceps; none of his cotemporaries, however, or immediate followers, mention them; but Albucasis, about a century after, described and delineated numerous instruments to facilitate parturition, and among them a short and long forceps; the former he styles *misdach*, the latter *almisdach.* It is sufficiently clear that these inventions were intended to supersede the necessity of opening the child's head, or otherwise mutilating it; and they seem to have been proposed with the view of extracting it alive. But I am quite at a loss to understand how this purpose could be answered; for they were formed with a sharp, beaked point at the extremity of each blade, and projecting teeth on the internal surface, so that the integuments of the child's head and face must of necessity have been lacerated. Albucasis, indeed, even gives directions that if the head be too large to pass, it should be *crushed* by the closure of the blades. On the whole, therefore, the Arabian forceps, so far from being considered an improvement on the instruments previously in use, can only be regarded as a clumsy and barbarous attempt at what has fortunately in after ages been accomplished.

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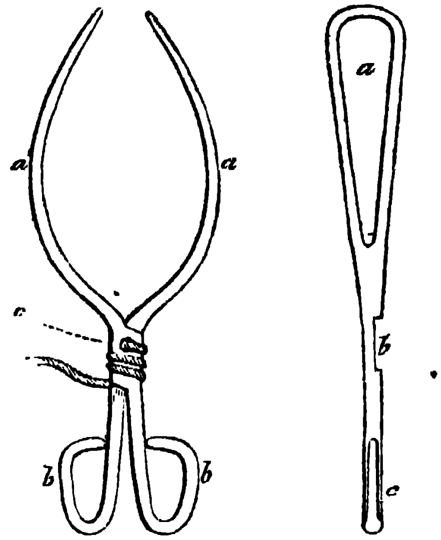
* The professional reader will easily comprehend the reason of my being desirous to put forth the sentiments conveyed in the text, in a language not *universally* understood in this country.

We find no particular mention of obstetric forceps from the time of Avicenna till the year 1554, when Rüeffe of Zuric, in a work "de conceptu et generatione hominis," dedicated a chapter to the consideration of obstetric instruments, under the title, "de modo quo et quibus instrumentis impediti et mortui infantes producendi." In this treatise he describes and delineates two kinds of forceps, the one with a beaked extremity, and the other perfectly smooth and unarmed; which latter he distinguishes as "forceps qua dentes eruuntur:" and this is the first attempt recorded of any obstetrical assistant (except the fillet) by which it was possible to extract a fœtus without injury to its person. Rüeffe's forceps, however, like all the former, were made with a common fixed joint, so that both blades must necessarily be introduced at the same time, and consequently they were almost useless from the difficulty of their application. Rüeffe has not left us the dimensions of the instrument he suggested, but from the cut attached to his work they appear very similar to our common lithotomy forceps, with the exception of the internal surface being smooth.

We are indebted to the elder Chamberlen for the valuable improvement of separating the blades. introducing them singly, and fixing them after their application. But the lock designed by Chamberlen (who was, from the clumsiness of the workmanship, doubtless not only the inventor but artificer of his own instrument) was by no means so firm and steady as to give the required stability, although it led to the joint now in use in England. As secrecy in inventions, however, was, in Chamberlen's time, not only tolerated, but practised, among the most scientific and enlightened men, the peculiar formation of his instrument, and the mode by which he proposed to effect the extraordinary good he boasted, was not known to his cotemporaries; and even to this day we are without any authentic document to inform us in what his peculiar mode of delivery consisted.

His son Hugh, in 1670, made an expedition to Paris, for the purpose of selling his secret; and, being called to a case which Mauriceau had seen and abandoned, declaring that it could not be terminated but by the Cæsarean section, he attempted to deliver by his forceps. He failed, however, as might have been expected, since the pelvis was highly distorted. The woman died undelivered in twenty-four hours; and he returned at once to England, bringing with him a copy of Mauriceau's work, of which he put forth a translation in the year 1672. (Mauriceau, 4to., Paris, 1728, tom. ii. p. 23.) In his preface to Mauriceau's book he has given us these memorable words:—"My father, brothers, and myself, (though none else in Europe that I know,) have, by God's blessing and our industry, attained to, and long practised, a way to deliver women, when the head, on account of some difficulty or disproportion, cannot pass, without any prejudice to them or their infants; though all others (being obliged, for want of such an expedient, to use the common way) do and must endanger or destroy one or both with hooks." He afterwards makes a lame apology for not giving publicity to their invention, considering that he would injure his father and his two brothers,—all three in practice—by doing so; and looking upon it as a secret peculiarly their own,—one which they had every right to use in a way most consonant with their own advantage. By a fortunate accident, chance has brought to light what neither liberality nor a desire to benefit mankind would have conceded to us. Dr. Peter Chamberlen (the brother of Hugh, whom I have just mentioned) purchased, towards the end of the seventeenth century, the estate of Woodham Mortimer Hall, near Maldon, in Essex, which continued in the family till about 1715, and was then sold to Mr. Wm. Alexander, who bequeathed it to the Wine Coopers' Company. About the year 1815, the tenant in occupation discovered in the floor, in the uppermost of a series of closets which are built over the entrance-porch, a trap-door. In the space between the flooring of this closet, and the ceiling below, were found, among a number of empty boxes, a cabinet containing a collection of old coins, divers trinkets, many letters from Dr. Chamberlen to different members of his family, and some obstetric instruments.

These instruments were given to Mr. Carwardine by the lady of the mansion; and that gentleman, with the most praiseworthy generosity, presented them to the Medico-Chirurgical Society. The letter accompanying this valuable donation, together with figures of the instruments found, was published in the 9th volume of that learned Society's Transactions. From the very fashion of these instruments may be traced the progress of Chamberlen's invention: one appears to be a simple lever, with an open fenestra, another a double blade, connected together by a pivot, which, however, is riveted; a third, in which the joint is formed by a loose pivot on one blade, receivable into a corresponding hole in the other; and a fourth, in which the instrument is fixed and made perfect by a tape passing through two holes—one in the commencement of each blade, where it springs from the handle. Such, then, there can be little doubt, was the improved invention of the Chamberlens.



The accompanying cut is taken from a drawing of the most perfect of Chamberlen's instruments. No. 1 is the forceps locked; *a*, the blades; *b*, the handles; *c*, the hole in the joint, through which is passed the string to connect the blades.

No. 2, the front view of a single blade; *a*, the fenestra; *b*, the groove in the shanks, forming the lock, by which the two blades, perfectly similar in form, are adapted to each other; *c*, the handle.

The following are the dimensions: extreme length, eleven inches and a half; length of blades, seven inches and a quarter; of handle, four inches and a quarter; greatest width between the blades, three inches and three-eighths; width between the blades at the points, three-fourths of an inch; greatest breadth of the blade, one inch and a half.

The celebrity enjoyed by Chamberlen's *arcanum* could not but attract the marked attention of the practitioners of his day; and consequently other men of inventive genius directed their minds to the same object. Dr. Wallace Johnson (System of Mid., 4to., 1769, p. 170) distinctly states that a pair of forceps came into his possession, which belonged to Mr. Drinkwater of Brentford, "who commenced practice in 1668, and died in 1728;" these he describes as being similar to those used by Chapman and Giffard.

To Giffard, indeed, the credit is generally acceded of having improved the forceps by forming them with an open fenestra; but after the account I have just given of Chamberlen's instruments, which all possess open blades, it will appear very questionable whether this idea is correct. Giffard began to employ the forceps in 1726, and sometimes used one blade simply as an extractor, sometimes both. We are in perfect possession of his practice, by the cases published after his death by his friend Dr. Hody.

Well acquainted as we are with the history of the minutest improvements in surgery, it is singular that we should be in ignorance as to who was the inventor of that greatest of all alterations in the obstetric forceps exemplified in our modern joint.

That the idea originated from those which Giffard, Freke, and Chapman used, is sufficiently evident; but the improvement in stability, security, and power, is so great as to amount to an actually new invention. The credit has been generally given to Smellie (Johnson, p. 175); but I question whether this is correct; for Mülder, in his History of the Forceps, states that his preceptor, du Pui, bought a pair of forceps with the improved joint, at the sale of Falconer's Museum, in London, in the year 1778; that he inquired of all most skilled in the science of midwifery, to whom was to be attributed the credit of the alteration; but that nobody could inform him, though all agreed that it was made after Chapman had openly described his instrument. The latter-named practitioner, indeed, who was the second public English lecturer on the obstetric branch of medical science, used to show a pair to his pupils, explain the mode of applying them, and published a treatise on the subject in 1733. To him we are indebted, as Dr. Lee thinks, not only for the first description of the forceps, but for the discovery of the principles which ought invariably to guide us in its employment. (Med. Gaz. May 19, 1843, p. 262.) The first *public* description of the forceps, however, appears to have been given by Mr. Butter, in the Edinb. Med. Essays for the same year, 1733. In that volume Chapman is severely censured for concealing his instrument, which he had given intimation of previously. In the third edition of his treatise on "The Improvement of Midwifery," Chapman apologises for having done so, and at page 92 he gives a drawing of it.

Before this time—viz., in the year 1720—Palfyn of Ghent, being in Paris to superintend the printing of his work on anatomy, presented a species of forceps to the Royal Academy of Sciences as his own, which he denominated the *tire-tête;* (Levret, Accouch. laborieux, 1770, p. 86); but from their delineation, as given by Mülder, we must judge them to have been clumsy, even in comparison with Chamberlen's. This instrument was afterwards claimed by Le Doux, a surgeon at Ypres; but no account of it was published until after Chapman's had been made known; it was given to the profession by Butter, in the Edinb. Medical Essays and Observations, for the year 1733, as stated above.

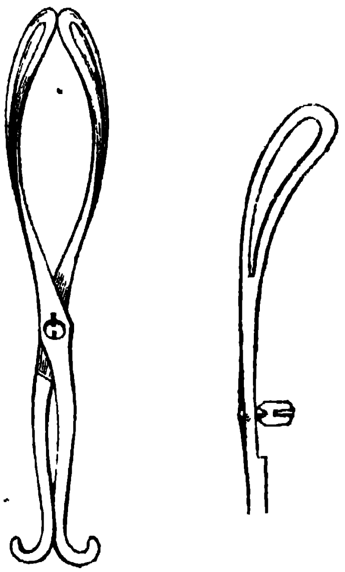
The great similarity that exists between the instrument used by Chamberlen in the latter part of the seventeenth century, and that described by Chapman in 1733, forms a very curious part of the history of the forceps. The representation of the latter, given by Mülder, resembles in many points that specimen of Chamberlen's, a sketch of which is traced above. It is difficult to account for this circumstance, when we consider the extreme jealousy with which Chamberlen kept his invention secret, except on the supposition that the instrument had been described to Chapman by some persons who had seen it employed by Chamberlen. Smellie, indeed, in his Introduction to Midwifery, states, that Chapman's instrument was the same which Chamberlen used; from whom he obtained his information he does not disclose; but through whatever channel he became possessed of it, he seems to have placed perfect reliance on his authority, and that with good reason.

The blades of all hitherto described were straight; and Levret first added the lateral curvature, that the convex edge might fit into the concavity of the sacrum, and the danger of injuring the rectum by the point be prevented: this form was afterwards, with some variation, adopted by Smellie, Osborn, and Clarke.

Modern forceps.—Whim, caprice, and fancy, (and perhaps also some little lurking desire for professional distinction,) have suggested an infinite variety of forceps, of almost all which Levret's and Smellie's patterns have formed the groundwork. Others are strongly stamped with an original character of increased utility; and such are the modifications suggested by the late Professor Davis, who applied his mind, with very considerable acuteness and ingenuity, to improving the mechanism of this department of surgical science; he adopted a wider blade than is commonly used; which allows the parietal prominence to pass more perfectly through the opening, and which embraces the child's head at more points of contact than Denman's, Smellie's, or Levret's. But it was evident that the irregularities of many pelves would not permit the introduction of two blades of the width which he thought most appropriate; and he therefore proposed to obviate this inconvenience in two ways—either by adapting a narrower blade to the wide one, or by using a short blade, as an antagonist to that first introduced. The idea of employing blades of different lengths, however, originated with Pugh of Chelmsford, in 1754. (Spence, Syst. of Mid. Edin. 1784, p. 545.) The great objection to Davis's invention consists in the number of instruments which such a contrivance requires we should be furnished with, and the inconvenience attendant on that multiplicity.

Other less useful changes have been made by different practitioners: of this kind is the late Dr. Hamilton's of Edinburgh, who adapted a hinge to the shank of that blade, to be introduced within the right ilium, that the necessity of bringing the patient close to the edge of the bed might be obviated; others, as Conquest, have, with the same intention, recommended that the handle should be made to unscrew, so that the blade might be introduced first, and the handle fixed afterwards. Saxtorffe, indeed, in 1791, added a hinge to each handle; but this was merely for the convenience of carriage, and is of a very different construction to that employed by Hamilton; for Saxtorffe's hinge turns inwards, while Hamilton's is bent outwards. Leake, in 1774, proposed a forceps with three blades; but this suggestion has been followed by no one of repute as far as I know.

French forceps.—In no part of operative surgery is the superiority of British practice over that of our ingenious and enlightened neighbours on the other side the English channel so strongly exemplified as in the contrast between our short forceps, and the one even to this day in use among them. I subjoin a cut of the fashion of the French forceps, taken from a pair brought to my father, a few years since, by a friend, from Paris, as a specimen of the advancement they have attained in this department of obstetrical science. It was made after the most approved fashion in every respect; and he assured me that he saw a perfectly similar instrument employed by the celebrated Dubois, while he was sojourning in their capital. Its extreme length is nineteen and a half inches; the blade ten and a half inches; the greatest width between the blades is two inches and three-quarters; the extremities of the points are in perfect contact when the handles are closed: it possesses a lateral curve; each blade is fenestrated, and slightly hollowed out internally; across the widest part it measures two inches; and the greatest diameter of the fenestra, near the extremity, is one inch and a quarter. The whole weight of the instrument is two pounds, five ounces, and three-quarters. Since the time I speak of, however, the forceps in common use in Paris has been decreased in size. Davis, in his work on operative midwifery, published in 1825, gives the dimensions of a pair of the same fashion with the above that he had lately received, which are rather smaller than mine, weighing *only* two pounds and one ounce avoirdupois. I



1 The instrument closed.
2. A partial side view of one blade, to show the curve and peg by which it is locked.

am informed that Madame la Chapelle has further diminished them in size and weight, still, however, preserving their original form. The joint is on a very different construction from ours; and, without prejudice, I think we may affirm it is much more clumsy. It consists of a pivot and mortise lock, loosely fitted, and not difficult to adjust. The handles are entirely of steel,—a continuation, indeed, of the material of the blade itself,—and bluntly hooked outwards at their extremities. With such an instrument in use, we cannot wonder at the necessity of the many cautions we meet with in the French works to prevent their *slipping*. We can only feel surprised that any child could be extracted alive through a pelvis, under the compression which its head must necessarily suffer, if the forceps retained their hold.

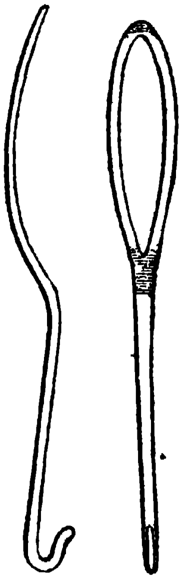
E.

VECTIS.—*History.*—My reasons for believing that the elder Chamberlen was the original inventor of the vectis, as well as the forceps, will be found in the following short history.

It is well known that his son Hugh, about seventeen years after his unfortunate visit to Paris, was obliged to flee to Holland, in consequence of having espoused the cause of James the Second; where for some time he practised midwifery; and having contracted an intimacy—if not a partnership—with Roonhuysen, he communicated his secret to him about the year 1693, on the receipt of a very considerable sum of money. Very soon the celebrated Ruysch and Boekelman, two other practitioners at Amsterdam, became participators in the secret. These surgeons scrupulously adhered to the terms of their agreement with Chamberlen: and only displayed the instrument, and described its use, to those of their pupils,—and that a very limited number, — who gave them a large additional fee for this extra knowledge. Among this number were John de Bruin and Peter Plaatman; and they also, under the same conditions of secrecy, instructed Titsing, Boom, and a few others. In a short time the credit of the instrument was raised so high, that the magistrates of the town forbade any of their surgeons to practise midwifery, until they had been examined by its possessors, and instructed in the manner of using it. (Bland, Med. Communications, vol. ii.) As it passed into a greater number of hands, its fame became proportionably spread; and in the year 1753, Visscher and Van de Poll,—physicians practising at Amsterdam,—most generously bought the secret for five thousand louis from Gertrude, the daughter of John de Bruin, the wife of Herman Van der Heide, (to whom it had been bequeathed by her father as a legacy), and made it immediately public. (Mülder's Hist. Forcipum et Vectium, p. 88, et seq.) The instrument thus dragged forth from comparative obscurity, about which so many conjectures had been formed, on which the hopes of the Dutch practitioners were so highly raised, and which the profession in general was so anxious to obtain, was found to be a flat, plain, unfenestrated piece of iron, slightly bent at both extremities into the segment of a large circle. On this discovery, many doubted—as well they might—whether De Bruin's heir had really allowed the true instrument to pass out of her possession; others, whether Roonhuysen had dealt fairly with his pupils; and others, again, whether Chamberlen had not acted a double part, by having originally sold to the Dutch physicians an instrument, of which he himself practically made no use; because, as it was then well known that Chamberlen's celebrated *arcanum* consisted of a double blade, it seemed impossible to reconcile this fact with the production of the simple, rude, almost straight piece of iron, which any one might devise and manufacture, without being possessed either of much inventive genius or turn for practical mechanics.

Since the fortunate discovery, however, of Chamberlen's original instruments, these inconsistencies appear to me easily cleared up; for among them are two simple levers, very similar in size, shape, and design, a figure of one of which is annexed.

It seems, then, fair to infer that both the forceps and lever, such as they were, were communicated to the Dutch practitioners by Chamberlen; and that, either in consequence of not being able easily to introduce the two blades, or not readily adapting them to each other when they were introduced; or perhaps—what is equally likely, since it agrees so well with the spirit of the times—finding themselves enabled to use the one blade with so much greater *secrecy*, and less chance of *discovery*, than two,—they became habituated to the employment of the vectis, acquired a certain degree of dexterity in its use, considered it the most efficient instrument, and consequently instructed those who applied for such knowledge in its properties, in preference to those of the forceps. And this supposition is strengthened by the fact, that Palfyn, of Ghent, in 1720, after many journeys to London and Amsterdam, for the purpose of ascertaining what Chamberlen's celebrated secret really consisted in, (which was known to have passed into the hands of the Dutch physicians,) was enabled, from the information he picked up, to form his *tire-tête*, which he presented to the Academy of Sciences at Paris, and which, after some modifications, became the forceps of Dusée and Buttor. It was certainly the prevalent belief, in Roonhuysen's time, that the instrument he employed was the forceps; and Levret states that Van der Suam, who lived many years with Roonhuysen, confirmed that idea; so that we may suppose he at first employed the forceps, but afterwards more frequently used the lever. (See Bland's paper on the Vectis, Med. Communications, vol. ii. p. 117.) Smellie, indeed, in the preface to his second volume (p. 7.) distinctly states that M. de Preville, who translated his work into French, says that the secret of the "instrument used by Roonhuysen is said to have been communicated to him by the Chamberlens from London."



Chamberlen's lever—the front and side views. The only difference between the two specimens found consists in one having a sharper point to the hook than the other.

If this history be correct, it is plain that we should be in error if we granted to Roonhuysen the honour of having discovered the vectis; for although he made a great change in the general appearance of the instrument, his alteration scarcely affected it at all as a mechanical power; since the curve of his lever, or rather De Bruin's—and I take it for granted that they were the same—as delineated by Mülder, is almost a segment of the same circle as that possessed by the instrument found among Chamberlen's collection. All the first vectes, indeed, such as Roonhuysen's, Plaatman's, Boom's, and Morand's, as well as Titsing's *spatula*, have nearly the same curve, of greater or less extent; and this also inclines me to believe that Chamberlen's was the original pattern.

I have said that Roonhuysen's lever consisted of a flat piece of iron, bent into a slight curve at both ends, and he generally employed it covered with soft leather. Titsing fancied he had improved on this plan, by padding the instrument with wool. It has been formed by different persons,—either for the sake of appearance, or from the presumption that such substances were less likely to inflict injury than the harder metal—of wood, horn, ivory, and silver. The vectis of Morand, in 1755, was of ivory; and that of Herbiniaux, in 1782, of silver.

As it was generally known among the profession, at the commencement of the last century, that some of the Dutch physicians possessed Chamberlen's or Roonhuysen's secret, it is not surprising that practitioners, as well in Holland as in other countries, should have endeavoured to ascertain in what it consisted, or to have invented for themselves some means to accomplish the same end. Thus, in 1738, Rigaudeaux, being called to a case in which the head was impacted, procured a common chemist's spatula, a foot in length: after having softened the blade in the fire, he bent it into a slight curve, and with it delivered the woman of a live child. Incited by his success, he formed an instrument very similar to

Titsing's in shape, though shorter, which he was in the habit of using continually. Like his predecessors, however, being desirous of reaping more than ordinary pecuniary advantages from his fortunate discovery, it was not until the year 1754—after Visscher and Van de Poll had published descriptions and delineations of De Bruin's instrument—that he made known the form and use of his own. Worrocquier of Lisle, also, it would seem, fell by chance upon the expedient of delivering by the lever, before that instrument was publicly known; for in 1753, being foiled in his attempts to terminate a labour by Smellie's forceps, at that time but just come into use, he employed one blade as a vectis, and had the satisfaction of bringing into the world a living infant. From that time he discarded the double instrument, and used a single blade, not unlike Titsing's in its fashion; with which, indeed, he afterwards boasted that in twenty-one years he had delivered twelve hundred women. Long before this time, however—viz., in 1715—Isaac de Bruas of Midleburg made an attempt to extract a child, when the head presented, with a blunt hook, such as he had been accustomed to use under breech presentations. He succeeded in his object, having slightly bruised the child's head. Correctly judging that the instrument was too thick, and not sufficiently wide for his purpose, he formed a fenestrated vectis, decidedly the best of all those first invented, and which, indeed, approaches nearer than any of them to the form of Lowder's—that variety now most in common use in this country. He published a description of it in 1755. (Mülder, p. 97—100.)

In the year 1784, Dr. Aitken of Edinburgh—a man of great ingenuity and mechanical invention, though extremely fanciful in his notions—having found by experience the difficulty of introducing a blade with the extremity considerably curved, and the uselessness of the instrument if the point was but slightly bent, contrived one that could be introduced straight, and carried *afterwards* to any required angle, by turning a screw at the extremity of the handle, so that it might adapt itself closely to the child's head. This supposed improvement he denominated the *living lever.*

F.

CRANIOTOMY.—*History.*—The first of all obstetrical operations practised, consisted in extracting the mutilated fœtus from the womb by cutting and sharp-pointed instruments, in whatever way it could best be accomplished. Thus, even, Hippocrates has left us some observations on this subject; and Celsus is particular in his directions, having dedicated the twenty-ninth chapter of his seventh book to the mode in which a dead child may be extracted from the uterus by means of instruments. We may trace in the very expressions used by Celsus, the antiquity of the prejudice, that the voluntary efforts of the fœtus were the principal efficient cause of its escape; for he says, "Ubi concepit aliqua, et jam propè maturus partus intus emortuus est, neque *excidere per se* potest, adhibenda curatio est."

The instrument he describes for this purpose is a cutting-hook, "uncus undique lævis acuminis brevis;" but he mentions no means by which the cranial bones might be perforated, if necessary. From this we may infer, that distortions of the pelvis were not known to the Greeks and Latins; else, since he speaks of breech and shoulder presentations, the fœtus being dropsical, and the mode of decapitating it when transversely placed, he would not have omitted to notice such a serious and dangerous cause of difficulty. Nor can we be surprised at this; for neither rickets nor mollities ossium seems to have existed in these ancient times. The first description, indeed, which we have of rickets was given in a treatise by Glisson, published in 1659. The habits of our early ancestors were not favourable to the production of either of these formidable affections; their poorer population was mostly engaged in agricultural or mechanical—not in what may properly in this age be termed manufacturing—pursuits; which latter, of all occupations, most fosters the rickety predisposition.

The Arabians instituted the practice of perforating the skull; and Albucasis has given us a drawing of an instrument designed both to open and extract the head. In later years, variously-fashioned perforators have been employed. Mauriceau's *tire-tête* consisted of a sharp-pointed, double-edged knife. Daventer used a long scalpel; others a crooked bistoury; Sir Fielding Ould invented an instrument which he called the *tenebra occulta;* Smellie adopted the scissors, which, with Johnson's curve added, I employ myself.

G.

Cæsarean Section.—*Notices of History.*—The earliest writers on medicine are silent on the subject of the Cæsarean operation; thus no mention of it occurs in the works, either genuine or spurious, of Hippocrates, nor of Celsus, Paulus Ægineta, Avicenna, or Albucasis. Pliny, indeed, tells us that the elder Scipio Africanus—the vanquisher of Hannibal—was introduced into the world by this operation (see note, p. 320), and that Manlius Torquatus owed his life to the same means.

He also avers that Julius Cæsar was ushered into life in this unnatural manner, and that from this circumstance first sprang the surname which the Roman emperors inherited. If this were the case, his mother Aurelia must have survived the operation, since she died whilst he was prosecuting the war in France, or while engaged in the conquest of Britain. (Suetonius in J. Cæsar; see also Plutarch, art. Jul. Cæsar.) This then would completely refute such an idea; and indeed there is nothing in history to warrant us in adopting this belief. Perhaps these anecdotes may owe their origin to the feeling generally indulged in by the ancients, that it was necessary to invest the birth of their great men with circumstances of an extraordinary character, for the purpose of elevating them above the common sphere of humanity. Shakspeare has not overlooked the advantage he might derive from the incident with which tradition had invested the birth of Macduff, (see Boece's Scotorum Historia, Paris, 1574, p. 254, l. 70; or the Chronicles of Holinshed, Hist. of Scotland, vol. i. p. 176, l. 31; whose work indeed, as far as Scotland is concerned, is merely a translation of Boece,) in one of his sublimest and most successful compositions. The last hope and frantic desperation of Macbeth, built upon the apparition's prophecy—

> "I bear a charmed life, which must not yield
> To one of woman born"—

suddenly forsakes him, when Macduff declares to him the manner in which he was introduced into the world.

> . . . "Despair thy charm
> And let the angel whom thou still hast served,
> Tell thee Macduff was from his mother's womb
> Untimely ripped."

If we were inclined to dip into mythological mysteries, and trace the operation to its remotest origin, we should learn that the God of Physic himself,—as is sung by Ovid,—was cut out of the womb of his mother Coronis by Apollo, after he had destroyed her by an arrow, for her infidelity.

> "Ut tamen ingratos in pectora fudit odores,
> Et dedit amplexus, injustaque justa peregit;
> Non tulit in cineres labi sua Phœbus eosdem
> Semina; *sed natum flammis uteroque parentis*
> *Eripuit*, geminique tulit Chironis in antrum."
> *Metam.* lib. ii. v. 626.

And that the life of Bacchus was preserved by the same means, when his mother, Semele, had been consumed under the embrace of Jupiter, who, according to her desire and his extorted promise, visited her in all the majesty of the skies.

> . . . "Corpus mortale tumultus
> Non tulit æthereos; donisque jugalibus arsit.
> Imperfectus adhuc infans *genetricis ab alvo*
> *Eripitur*, patrioque tener (si credere dignum)
> Insuitur femori; maternaque tempora complet."
> *Metam.* lib. iii. v. 308.

So that it would seem the world is indebted both for medicine and wine to this operation.

The grave assertions of the naturalist in this respect may be as fabulous as the visionary flights of the poet: but Ovid's description of the birth of Bacchus and Æsculapius in itself would lead us to infer that before his time the operation had been put in practice on the dead subject.

That part of the Jewish Talmud, called the *Mischna*, compiled, according to Lightfoot (Fall of Jerusalem, vol. i. p. 369, sect. vii.), at the close of the second century of the Christian era; or, according to Jost, (Geschichte der Israeliten seit der Zeit der Maccabæer, vol. iv. p. 103), in the year 250, contains three passages which bear upon this question. I give the accredited Latin translation. In the fifth volume, or *Ordo Sacrorum*, Maimonides, in explanation of the words *si quis è latere natus sit*" in the text—(which passage is devoted to orders respecting the mode in which firstling lambs, cut out of the womb of their parent, should be disposed of) has the following: "Si latera ilii perfoderint, atque ita fœtum eripuerint. *Hoc etiam fieri solet in muliere quæ difficulter parit, et in descrimen mortis venerit.*"—(Vide edit. fol. Amsteled. 1702, tract. *Bechoroth.* p. 161.) Again, in the same volume (p. 182) we find in the text, "*Si quis e latere prodierit,* et quis post illum venerit, neuter primogenitus est, neque pro hereditate, neque pro sacerdotio." To illustrate which, Maimonides has "Fieri potest ut hæc mulier duplici progenie gravida sit atque unus prodeat *postquam ventris latus incisum sit,* et posteà prodeat alter per viam ordinariam," &c. And in the sixth volume, or *Ordo Puritatum*, we read "*Propter fœtum, qui per latera ventris prodiit,* non sedent dies immunditiei, nec dies munditiei, nec propter ipsum tenentur ad sacrificium."—(Amstel. 1703, tract. *Nidda,* p. 403.) From these sentences we cannot but infer, both that the operation had been performed on the living subject in these early days, and also that some women had survived. It is said that Numa Pompilius, the second king of Rome, enacted that the body of no female, who died undelivered, should be burned or buried, until after the fœtus had been removed by incision.

The earliest account of this operation extant in any medical work, we find in the *Chirurgia* of the celebrated Guy de Cauliac, (tract. vi. doct. 2, cap. vii. sect. *de extractione fœtus,*) which was written in the year 1363; but the author only speaks of it as proper to be resorted to after the mother's death. The same mention is made by Paré, who limits its adoption to those cases in which the woman died undelivered; and Rousset's work, adverted to in the text, is the first that gives any *history* of its performance on the *living* subject.

Principally, perhaps, owing to Rousset's publication, it became very frequently, and, indeed, generally adopted in different parts of the continent. M. Simon has given, in the first and second volumes of the Memoirs of the Royal Academy of Surgery in Paris, seventy-four cases, in which it was declared the operation was performed successfully, in as far as regarded the mothers. In three of these cases he states that the operation was performed twice upon the same woman; in two, three times; in one, five times; in two, six; and in one, seven. These accounts seem so improbable, that I cannot help thinking craniotomy or some other operation has been confounded with that under consideration. One of the cases is that of the wife of Sonne, a physician at Bruges, who is reported to have been delivered seven times in this manner, *her husband being the operator in all the instances.* Another, that of the wife of Olaus Rudbecke, professor of physic at Upsal in Sweden,—the founder of the botanic garden there, which became afterwards the scene of Linnæus' labours,—who was himself a skilful anatomist. In this instance also *the husband was the operator,* and he is said to have saved both mother and child. Within the last few years, indeed, the Cæsarean section has been performed in Germany four times on the same patient,—in June, 1826; January, 1830; March, 1832; and June, 1836; three of the children were extracted alive, and the woman was suckling the last at the date of the report.—See British and Foreign Medical Review, vol. ii. p. 27, and vol. iv. p. 521.) Meigs (Obstetrics, edit. 2, p. 586) gives a case in which this operation was performed successfully, both as regards the mother and child, twice upon the same patient. He himself assisted at the second operation.

There is no question that many of the cases to which credit has been allotted, are not founded in truth: and, among these, we may enumerate the instance of Jane Seymour: for although Mauriceau (Paris, 1721, vol. i. p. 358) and Dionis, (Cours d'Opérat. Démons. 2,) in France, as well as Hull (Defence of Cæsarean Section,

p. 13. See also Aikin's Biographical Memoirs of Medicine, 1780, p. 69, art. George Owen, M.D.) and some others in this country, gave credence to the rumour, there is little doubt that the story was fabricated, to swell the list of the licentious Henry's barbarities. Some suppose the unfortunate queen died two days after her labour, but there is positive evidence to prove that she survived twelve. If so, it is very improbable that the Cæsarean operation was performed on her person. Edward VI., in his own journal, states that his unhappy mother died "within a few days" after delive[illegible] (Burnet, vol. iv. p. 1.) Strype (Histor. Memorials, fol. 1721, vol. ii. p. 5) says she died on the night of the twelfth day; and he founds his statements on a manuscript in the Heralds' College. And Fuller, in his Church History, (century 16th, book vii. p. 421, fol.) on this very subject has the following words. Speaking of the death of Edward VI., he says—"For his birth, there goeth a constant tradition, that, *Cæsar-like*, he was cut out of the belly of his mother, Jane Seymour; though a great person of honour (deriving her intelligence mediately from such as were present at her labour) assured me to the contrary." He then gives a letter dictated by the queen to the privy council, dated October 22nd, ten days after her delivery; and adds a certificate, signed by six physicians, dated Wednesday, [the 24th,] the day of her death, in which, although her condition is described, no mention is made, or the least hint given, of any operation having been performed on her person. (The originals are preserved among the Cottonian MSS., NERO, c. 10.) The story runs, that it was supposed a natural termination of the labour could not take place; and the officiating attendant, on informing Henry of the circumstance, inquired of him whether he willed that the mother's or the child's life should be saved; to which he replied, with his accustomed coarseness and brutality, "Save the child by all means, for I shall be able to get mothers enough."—(See Dionis, Cours d'Opérations Chirurg., Démonst. 2.) Or according to others, "For it is easier to get wives than children."

O'Meara relates, on the authority of Napoleon himself, that the labour of the Empress Marie Louise also was lingering, there being "a wrong presentation;" and it was feared either that the child must be sacrificed, or the Cæsarean section performed; that Dubois put the same question to Napoleon, who desired him to forget the empress's station, "and to treat her as he would a little shopkeeper's wife in the Rue St. Denis; but if one life must be sacrificed, to save the mother." (A Voice from St. Helena, 1822, vol. ii. p. 368.)

H.

INDUCTION OF PREMATURE LABOUR.—Many historians of different ages bear ample testimony to the voluntary destruction of the offspring, as well before as after birth. The procuring abortion, indeed, was cultivated as an art by the ancients, particularly the Romans, at the period of their greatest power; and Juvenal employed his severe and caustic pen in exposing this, as well as the other crimes and vices of the age.

The following passage will be found in the sixth Satire; contrasting the condition of the poor with that of the rich, in regard to child-bearing, he writes:—

> "Hæ tamen et partûs subeunt descrimen, et omnes
> Nutricis tolerant, fortunâ urgente, labores:
> Sed jacet aurato vix ulla puerpera lecto.
> Tantum artes hujus, tantum medicamina possunt,
> Quæ steriles facit, *atque homines in ventre necandos*
> *Conducit.* Gaude, infelix* atque ipse bibendum
> Porrige, quicquid erit. Nam si distendere vellet,
> Et vexare uterum pueris salientibus, esses
> Æthiopis fortasse pater."
> Verse 501.

Also at verse 365 of the same satire, the whole of which is levelled at the vicious practices of the Roman women, we find

> "Sunt quas eunuchi imbelles, ac mollia semper
> Oscula delectent, et desperatio barbæ,
> *Et quòd abortivo non est opus.*"

---

* He addresses Posthumus, dissuading him from marrying.

Again, in the second Satire, verse 32,

> " *Cum tot abortivis fœcundam Julia vulvam*
> *Solveret.*"

Ovid dedicates the 13th and 14th Elegies of his second book of Amours to his mistress, who had endeavoured to make herself miscarry, and tries to dissuade her from committing such an act again. In the 14th Elegy he says:—

> " At teneræ faciunt, sed non impunè, puellæ,
> Sæpe, *suos utero quæ necat*, ipsa perit."

There can be no doubt that the preservation of personal symmetry, which, indeed, Ovid pointedly alludes to, and the trouble of a family, were the motives that induced the Roman ladies to have recourse to means for getting rid of the fruit of conception, before its life was made evident to their senses; and it was not till Christianity, by her mild and humane precepts, obtained a sovereignty over the minds of this people, that the custom was abolished.

Tertullian, the celebrated Christian writer of Carthage, in his Apology for Christianity, having censured his countrymen in the strongest terms for the practice of murdering their live children, says—"But Christians are now so far from homicide, that with them it is utterly unlawful to make away with a child in the womb, when Nature is in deliberation about the man: to kill a child before it is born, is to commit murder by advance; and there is no difference between destroying a child in its formation, and after it is formed and delivered; for we Christians look upon the ovum as a man in embryo; he is a being like the fruit in blossom, and in a little time would have been a perfect man, had Nature met with no disturbance." (Chap. ix.)

While the destruction of the ovum was not regarded as a sin to be abhorred, but rather as an art honourable to science, and useful in application, we cannot wonder that the practice, if it were really devoid of personal danger, should be so extensively resorted to; because we cannot presume that the mother is actuated by the same affection towards the being in her womb, of whose life she has had no evidence, as she must be to her mature infant, brought forth into the world under great suffering and danger to herself, and capable of sustaining an independent life.

It is curious to observe that the very means which the ancients resorted to, for the purpose of procuring the evacuation of the womb, are exactly those which are practised in the present day, where imperious necessity demands it: for Tertullian, while reprobating the custom, has described the instrument by which the ovular membranes were punctured, in these words—"Est etiam æneum spiculum, quo jugulatio ipsa dirigitur, cæco latrocinio, ἐμβρυοσφακτην appellant; utique viventis infantis peremptorium." (Liber de Animâ, chap. xiii.) And Ovid, who lived nearly two hundred and fifty years before Tertullian, alludes to the same operation in the following passage of the elegy just quoted, addressed to his mistress, who was pregnant by him:—

> "Sponte fluent matura suâ: sine crescere nata;
> Est protium parvæ non leve vita moræ,
> *Vestra quid effoditis subjectis viscera telis,*
> Et nondum natis dira venena datis?"

I.

INVERSION OF THE UTERUS.—The most horrifying case of mismanagement, perhaps, that ever occurred either in medicine or surgery, arose from an adhesion of the placenta, and is put on record by Dr. Boys, formerly physician-accoucheur to the Westminster General Dispensary. He was present at the dissection of the body, together with Mr. Brookes, Drs. Hooper, Fothergill, and several other gentlemen. They found wanting—the uterus, right ovarium and tube, part of the vagina, and part of the left Fallopian tube; the greatest part of the rectum, cæcum, appendix vermiformis, the ascending portion of the colon, the right side of the transverse arch, all the ilium and inferior part of the jejunum,—altogether many feet of the small intestines,—with part of the mesentery, and the greater part of the omentum majus, which had been torn away from the right side of the large curvature of the stomach. The remaining portion of the transverse arch of the colon, and much of the jejunum, were torn from their attachments. The labour occurred on September 18th, 1807, and was complicated with an adherent placenta. The attendant broke the placenta by pulling at the funis. This produced hemorrhage, and he left the patient. In about fifty hours, no attempt having been made to relieve her, the nurse found something hanging out of the external parts; and on his being apprised of it, he said it must be taken away, and placed her on her left side for that purpose. He made use of considerable exertion, and caused great pain. He then ordered a pair of scissors to be brought, saying there was a false conception, which must be removed; while using them the patient fainted, and died immediately. The parts removed by this brutal operator were preserved, and proved to be those I have just mentioned. We could scarcely suppose that such ignorance and barbarity could exist, as exemplified in the conduct of this case. But, independently of the precise account drawn up by Dr. Boys (a letter on the Practice of Midwifery, occasioned by, and including an account of the unfortunate case, by John Boys, M.D., &c., 1808), we have my father's testimony in corroboration; for he saw the parts in Mr. Brookes's dissecting-room. The man was tried at the Old Bailey, for murder, and was acquitted.

Ruysch (Pract. Obs. in Surgery and Midwifery, trans. 1751, p. 33) says he has met with two instances of inverted uterus within one week. After this declaration, we cannot wonder that Ruysch, placed in so responsible an office at Amsterdam, should have written so strongly against removing the placenta artificially in any case.

K.

TRANSFUSION OF BLOOD.—The idea of transfusing blood from the system of one animal into that of another is by no means of modern date. Mercklin, in a treatise *de ortu et occasu transfusionis sanguinis*, published at Nuremburgh in 1679, states that Marsilius Facinus, *de studiosorum sanitate tuenda* (Lugd. 1560), proposed to renew the vigour of old men by making them suck, "*more hirudinum*," two or three ounces of blood from a vein in the left arm of a young person; and that Joh. Colle, *de methodo facile parandi jucunda, tuta, et nova medicamenta* (Venit. 1628), recommended that the blood from the vein of a young man should be transmitted *per fistulam* into the vein of an old man for the same object. He quotes also Andrew Libavius, who, in his *Appendix Syntagmat. Arcan. Chymic.* (edit. Francofurt, 1615, cap. iv.) has these words:—"Adsit juvenis robustus, sanus, sanguine spirituoso plenus. Adstet exhaustus viribus, tenuis, macilentus, vix animam trahens. Magister artis habeat tubulos argenteos, inter se congruentes. Aperiat arteriam robusti et tubulum inserat, muniatque: mox et ægroti arteriam findat, et tubulum fæmineum infigat. Jam duos tubulos sibi mutuo applicet, et ex sano sanguis arterialis, calens, et spirituosus saliet in ægrotum unàque vitæ fontem afferet, omnemque languorem pellet." There is no account of the practice having been resorted to by either of the individuals just mentioned; but numerous experiments were made subsequently, during the 17th century, on this subject. In the four first vols. of the Philosophical Transactions will be found many papers in which these operations are detailed at length. Drs. Lower (of Oxford) and Edmund King were the originators of the practice in this country, and their experiments were first undertaken in the year 1666, as detailed by Mr. Boyle (Philosophical Transactions, vol. i. p. 353). They were soon followed by Denys, of Paris, who contended for the honour of the invention. A dispute in regard to priority arose, which was carried on between the English and French *sçavans* with no little acrimony, and in a spirit far from philosophic. In these trials not only was the blood of one genus of animals transfused into the system of others of the same species, but an interchange was made of the blood of individuals of different species,—even from the graminivorous into the carnivorous,—

without injury to the health of the animals. In June, 1667, Denys performed his first experiment on the human subject (vol. ii. p. 517); and on the 23rd of November of the same year, Lower and King put it in practice on a man named Arthur Coga. The operation was performed at Arundel House, "in the presence of many considerable and intelligent spectators." The emittent animal was a sheep, and the amount transfused about twelve ounces. It does not appear, however, that the man was labouring under any disorder, since it is stated, that "*after the operation*, as well as in it, he found himself very well." (P. 557.)

Experiments were also made with medicinal and other substances, and some even before blood was used; thus Boyle (Usefulness of Experimental Philosophy, Part ii. Essay ii. p. 53) relates that Dr. Christopher Wren, Savillian professor at Oxford, transfused opium and other medicated infusions into the veins of dogs previously to the year 1665, as noticed in the Philosophical Transactions, vol. i. p. 128. In 1667 (vol. ii. p. 490), Francassati, professor of anatomy in Pisa, is reported to have injected nitric and sulphuric acids, as well as other corrosive matters, into the jugular veins of dogs; and (p. 564) Fabricius introduced purgative medicines into the median vein of a man and two women in the hospital at Dantzic: the man was affected with secondary syphilis, the women with epilepsy; one of the women died; the other two patients appeared to be benefited.

The enthusiasm with which these experiments were received, as well by the English as the continental physicians, and the extravagant hopes entertained of the value of the practice, exceeded all bounds. It was confidently asserted that decrepitude, age, and disease—nay, even death itself—would flee before this all-powerful and all-resuscitating process. Short-lived, however, were such high-wrought expectations; and the death-blow to this pernicious practice, in France, at least, was given by an unfortunate case that occured under the hands of Denys. The patient was an insane man, who had twice been subjected to the experiment, without injury; and, as was said, with advantage. On the third occasion, however, he died while the operation was being performed. Much excitement ensued throughout the whole of Paris; Denys was arraigned for causing his death; and this mode of treating diseases was denounced by the authorities under severe penalties. This occurred in November, 1669 (vol. iv. p. 1075); from that time the system gradually fell into disuse; and we hear little of transfusion of blood until its late revival. Dr. Harwood, indeed (afterwards Professor of Anatomy in the University of Cambridge), in the year 1785, made it the subject of his thesis for the degree of M.B.; and, repudiating the extravagant notions of its first supporters, that it would remove or assuage all diseases, restore vigour, and prolong life to an almost indefinite period, limited his advocacy of the measure to supplying fresh blood to the system of an animal exhausted by hæmorrhage. He made a number of experiments upon brutes, and suggested the possibility of its being applied to man under similar cases. His proposals, however, seem bounded by the intention of transfusing the blood of other animals into the human system, and no mention is made of employing human blood.

Some physiologists contend that the operation of transfusing medicated fluids, and blood itself, into the system of man, is of very remote origin; and they ground their suppositions on some passages in the ancient poets. Thus, Ovid represents Medea as renewing the youth of Æson by injecting the juice of herbs into his veins:—

> "Quod simul ac vidit, stricto Medea recludit
> Ense senis, jugulum: *veteremque exire cruorem*
> *Passa, replet succis.* Quos postquam combibit Æson,
> Aut ore acceptos, *aut vulnere*, barba, comæque
> Canitie positâ, nigrum rapuere colorem."
>
> *Metam.* lib. vii.—v. 285.

This is no warrant for such a belief; and the probability is, that the fancy originated, not in any practice then pursued, but merely in an adventurous flight of poetry. It has been even supposed that in these early times blood was actually transmitted from one person to another; and a second passage in the same fascinating author, where he describes Medea's fiend-like deception practised upon the unsuspecting daughters of Pelias, has been quoted in proof:—

> . . . . "Quid nunc dubitatis inertes?
> Stringite, ait, gladios, veteremque haurite cruorem,
> *Ut repleam vacuas juvenili sanguine venas.*"
>
> *Metam.* lib. vii.—v. 332.

That these lines will not bear any such interpretation must be immediately evident; the expression relied on is nothing more than a poetic method of describing her intention generally of restoring him to youth; as, indeed, the whole context, and the pretended sanatory preparations she makes, abundantly testify.

L.

Fœtal animation suspended.—*Resuscitation.*—When the child does not breathe immediately on its birth, it is sometimes difficult to ascertain whether it is actually dead, or its animation is only for a time suspended. Animation may be suspended by many causes; immoderate loss of blood, sustained by the mother, as well as pressure on the fœtal head, or on the funis umbilicalis, or the placenta, will produce the effect; but it more frequently results from one of the latter two than either of the former causes. This pressure may be the consequence of the funis falling down by the side of the head; or of the gravid uterus, by its action, squeezing it or the placental bed between its own parietes and the fœtal body. Whenever, then, a child does not attempt to breathe soon after it is born, we should endeavour to ascertain whether it is really dead, or whether animation is only suspended for the moment. This may usually be known by placing the hand over the region of the heart; and if there be the least tremulous pulsation observed, it should be taken as an indication that the child may be saved. A newly-born infant is exceedingly tenacious of life, and many children have been recovered, by the use of proper means, who would inevitably have perished under less careful management. Often, too, a state of deep stupor, owing to the compression the brain has suffered during the passage of the head, prevails for a little after birth, which, unless removed, might terminate in death; for while it lasts, the nervous system is not susceptible of those impressions necessary to induce the first act of breathing life. The child may then frequently be roused by two or three smart slaps on the buttocks, back, and chest; and on its being awakened from its lethargic state, a sob will be drawn; this will end in a cry, and respiration will be established. This simple expedient will of itself often be found sufficient, without the employment of any other resuscitating measures.

Should this, however, fail to excite the first respiratory effort,—provided the heart's action be too feeble to propel the blood through the navel-string,—the separation should be effected as speedily as possible, and the child immersed entirely in a warm bath. Whenever we are attendant upon a case of lingering labour, or one complicated with hæmorrhage, or any other accident, after which it is probable that the infant may be born with impaired vitality, it is right that we should have in readiness a small tub, or pan, with a sufficient supply of hot and cold water, that a bath of proper temperature may be made instantly. We shall frequently find that the stimulus of warmth applied to the skin will excite the respiratory organs. The temperature should be 97° or 98° of Fahrenheit. But if, after immersion for two or three minutes, the child does not gasp, and we observe that the heart is acting less forcibly than before the bath was had recourse to, its continuance in the warm water will do harm both negatively and positively;—in a negative manner, because it prevents our calling to our aid other more efficacious means; and positively, because the warmth—when the powers are reduced to a certain point of depression—seems to act injuriously on the nervous system; for it has been proved experimentally, by Dr. W. F. Edwards, of Paris (De l'Influence des Agens Physiques sur la Vie), that animals will drown much quicker in warm than in cold water, and that newly-born mammiferous animals die most slowly in water at about 60°. Again, Sir Anthony Carlisle found that a hedgehog submerged for thirty minutes in water at the temperature of 40°, would survive, when removed; but that if kept under water at 94° for eight minutes it would die; and Dr. Haighton had previously made some similar experiments upon kittens with the same result. From a knowledge of these facts we should infer, that it would be dangerous to keep a newly-born child in water at a high temperature, if the circulation and respiration were suspended; because the heat would tend to exhaust its powers. The warm bath must only be persevered in so long as the child breathes, (though the gasps may be at long intervals), and while the circulation is going on. The next means to be used, then, is artificial inflation of the lungs; by which we keep up, for a time at least, the heart's action.

A hot flannel, or blanket, must be prepared; the child should be taken out of the bath; the surface rapidly wiped as dry as possible; a bit of clean flannel should be placed over its face; the nostrils may be squeezed together with the thumb and finger; and we should blow into its mouth with our own, alternately inflating the lungs and depressing the chest. The flannel is merely useful for the sake of cleanliness; it is by no means absolutely necessary, but it does no harm, and it is as well that something should be interposed between the child's mouth and our own. Some practitioners, as Blundell, recommend that we should always be furnished with a tracheal pipe, by which the lungs may be more perfectly inflated than by the mouth alone. The only objection which can be made to the use of the pipe is the difficulty in its introduction through the rima glottidis, and the consequent loss of much important time. It is much more apt to pass into the œsophagus than the trachea, and embarrass the operator: if, however, he has acquired a certain degree of dexterity in its introduction, and can employ it without delay, the lungs are more likely to be efficiently filled by its aid than without it. For myself, I have often restored newly-born children in the more simple manner just recommended; for though some air will certainly pass through the œsophagus and distend the stomach, still a large quantity will also find its way into the lungs; and although the abdomen becomes somewhat tumid, that does not interfere with the proper descent of the diaphragm, nor produce more than momentary inconvenience; and certainly, this slight embarrassment to full respiration is not to be put in competition with the chance of restoration that the process of inflation affords.

Dr. Snow, indeed, in a communication on the resuscitation of still-born children, to the Medical Gazette (November 5, 1841, p. 225), thinks that "not much good can be expected from a measure that would undoubtedly suffocate a living child." He therefore argues against inflation in the manner that I have recommended; and warmly advocates the use of a double-action syringe, invented by Mr. Read. One great drawback to the value of this instrument is, that it will not generally be at hand when required; and whatever theoretical objections there may seem to exist against the inflation being practised by the mouth of the operator, I can testify that in practice they are of little account; for I have myself restored very many children by the method above stated, who I am persuaded would have soon died, had some means of that kind not been had recourse to.

Provided, however, still the child does not breathe naturally, while the heart continues to act, as is often the case, we may rub a little spirit on its chest and back, and shoulders; and we may irritate the glottis also, by letting a drop or two of spirit fall on it from the tip of our finger. This will often produce a convulsive sob, which may be the commencement of the respiratory process. Our efforts must be kept up with perseverance, while there is the least quivering motion perceptible along the cardiac region; for it is proved beyond a question, that in the lower animals the heart may be kept in action, by inflation of the lungs, long after death has unequivocally taken place. Thus Le Gallois kept up the heart's action in rabbits for many minutes, and even some hours, after he had taken off the head—the vessels having been previously secured—by alternately inflating and compressing the lungs; and Sir B. Brodie (Phys. Researches, p. 3 *et seq.*), has also shown that in many animals artificial respiration will support the circulation of the blood for some time after their heads have been cut off. Hence, however unpromising the case may be, it is our duty, whenever there is the least indication of the heart not being completely at rest, to use the most vigorous means for the purpose of restoring its full powers; and this particularly, as both Le Gallois and Edwards have proved that a newly-born animal can live without air for a much longer time than an adult of the same species.

It must be evident that we are more likely to apply the means at our disposal for the resuscitation of children apparently still-born, with advantage, if we are acquainted with the agency by which Nature institutes the first inspiration; and I have therefore thought it would not be out of place to give my views of the commencement of this process; especially as attempts have been made to account for it in various ways, which, as it seems to me, are inconsistent with sound philosophical reasoning.

Some of these speculations are founded upon mechanical, others on vital principles: some of them consider the fœtus a mere passive body, in the institution of the new process;—some that the commencement of the function depends on its own active exertions; and others that it is forced on the recently-born animal by the urgency of necessity.

Thus Pitcairne (Dissert. p. 62) believed that the air by its own weight forced itself into the lungs, so as to distend their cells. Swammerdam (De Respir. lib. ii. cap. 1) conceived that there was a space between the lungs and the parietes of the chest filled with aqueous vapour, which, becoming condensed when the fœtus is born, allowed the air to pass through the trachea, and caused the lungs to be distended. Lister (De Respiratione, in exercit. anat.) accounted for the first inspiration by the change in the circulation that occurs, from the closure of the fœtal sanguiferous ducts, and the sudden determination of such an increased quantity of blood through the pulmonary arteries. And Bostock explains it on mechanical principles, when he states, "The first degree of expansion which is produced in the lungs of the newly-born infant, depends merely on the removal of external pressure, which permits the different parts of the trunk to resume their ordinary position." (Physiol. 1826, vol. ii. p. 40.) Wytt (on Vital Motions, sect. ix. p. 109—122) would not allow that causes merely mechanical were the agents; he therefore falls back upon a "sentient principle," and presumes that the infant is born with a natural propensity or appetite for air, similar to the sensations of hunger and thirst. And Haller, believing that the fœtus is nourished by the *liquor amnii*, attributes the first effort to the habit of swallowing, which it has acquired while *in utero*. He supposes that on its birth it opens its mouth, in search of the accustomed food, and that the external air immediately rushes into the lungs. "*Si animal in utero deglutit*," says he, "*si idem nixus extra uterum editus aerem invitat et haurit, crediderim causam inventam esse, quare animal in lucem editum respiret. Cibum quærit, in quo natabat, aerem invenit, in quem se nunc demersit.*" (Element. Physiol. lib. viii. sect. v. c. 2.) Wilson Philip (Quart. Journ. vol. xiv. p. 100) considers the muscles of respiration as under the control of the will; and he supposes the first inspiration to be entirely analogous to the first act of deglutition. Petit (Mém. de l'Acad. 1733, p. 6) refers it to some inexplicable influence which the muscles and animal spirits reciprocally exert upon each other; Boerhaave (Instit. sec. 691) and Buffon (Nat. Hist. vol. iii. p. 111) to the struggles of the fœtus, by which all the muscles, particularly the diaphragm, are thrown into strong action. Elliotson (Notes to Blumenbach, p. 84) gives the credit entirely to the sensation of cold which (according to him) the child must experience in first emerging from its warm nest. Borelli (par. ii. p. 117) and Soemering (Corp. Human. Fab. tom. vi. sec. 70) confound the physical and final causes, and content themselves with reso[illegible]ng the question into the necessity that now exists for the child performing for itself functions that had hitherto been exercised on its behalf by its parent; while Darwin infers that the same necessity is thrust upon it by the circulation through the umbilical vessels having become arrested: this producing an uneasy sensation, the whole muscles of the body,—particularly the diaphragm and intercostals,—are thrown into action; and thus, to use his own expression, "respiration is discovered" (Zoonomia, vol. i. sect. 16, § 4). Blumenbach (Physiol. § 151) attributes the fresh function to various causes acting in concert; namely, "the congestion of the aorta, from the obstruction of the umbilical vessels; the danger of suffocation from the cessation of those changes of the blood, in regard to oxygen and carbon, hitherto produced in the placenta; the novel impression of that element into which the child, hitherto an aquatic being, is conveyed; the cooler temperature to which it is now exposed; and the many new stimuli which are applied." And Snow (Med. Gaz. Nov. 5th, 1841, p. 227) ascribes it to a "sensation or impression, arising from a want of oxygen in the system, and conveyed to the *medulla oblongata*, either by the blood circulating in it, by the nerves in connection with it, or by both causes."

Of the foregoing attempts at explanation, almost every one is as unsatisfactory as the other. The *sense of suffocation* produced by the closure of the umbilical vessels cannot occasion the change that takes place in the lungs, because the child breathes and cries before the circulation through the umbilicus is impeded. Neither can the *cold* striking on the surface of the body, stimulate the muscles of respiration to contract, since a gasp is frequently observed before any considerable sensation of cold can be experienced. Nor can we explain it on the principle of *the mouth being opened in search of the accustomed food;* as we have evidence to prove that the fœtus does not swallow while *in utero*, and is not sustained by the circumambient fluid. We cannot well imagine *a natural appetite for breathing;* we cannot understand how *the pressure of the atmosphere on the mouth and nostrils* can force the air into the lungs; because the external surface of the chest is subjected to the same weight that is applied to the entrance of the air passages, and the one pressure would counterbalance the other; and we know that there is *no space filled with aqueous vapour in the chest*, which could be condensed, so as to give the lungs room to play.

Each of the explanations offered above, being evidently fallacious, may not the first inspiration be rationally accounted for on the principle of *nervous excitability?* May we not suppose that *the stimulus of the atmospheric air applied to the extremities of the cutaneous nerves, is the efficient cause?* We have a good opportunity of observing the stimulating effects of the atmosphere (and we presume it is indebted for that stimulating quality mainly to the oxygen that it contains) on irritable ulcers. Whenever we remove the dressings from such a sore, unless it be thickly coated with pus, the patient will be sensible of a sharp pain, in consequence of the air coming into direct contact with the denuded surface. The same stimulus, in a mitigated degree, acts on the highly sensitive skin of the newly-born fœtus, hitherto unaccustomed to it.

Dissection teaches us that the cutaneous nerves communicate most freely with each other, and that one part of the skin is supplied from the same source as the diaphragm, the chief power employed in respiration. The *phrenic, or internal respiratory nerve*, is derived from the second, third, and fourth cervical; and large branches from both the second and third supply the back part of the head, jaw, neck, shoulder, arm, and the upper parts of the back and chest. (Swan on the Nerves, p. 62.) Thus, then, the diaphragm and coverings of the upper portion of the body,—parts remote in situation,—*are connected by the direct sympathy of nervous communication;* and it would be an inevitable consequence, that any stimulation applied to the extremities of one set of branches, supplying the skin, would be propagated to those other extremities of the same nerve which ramify upon the diaphragm. The consequence of that stimulation would be the contraction of that muscle; by that contraction its convexity towards the thorax would be destroyed; it would be drawn into the form of an inclined plane; the capacity of the chest would be increased; and the external air would rush through the trachea into the pulmonary cells, to fill the void thus created.

Or, following Sir Charles Bell in his philosophical and conclusive arguments, we shall see this subject even in a clearer and more striking and decisive li[illegible]t. Every anatomical student, not a mere tyro, is now fully aware that that enlightened physiologist described the spinal marrow as consisting of three double columns (On the Nervous System, p. 24):—the anterior giving origin to the nerves of motion,—the posterior to those of sensation,—and the middle to those subservient only to the function of respiration. To the central column of the *medulla oblongata* or the "respiratory tract," he traces the undermentioned nerves, given off in the following order:—First, the *facial respiratory*,—the *portio dura* of the older anatomists;—second, the *glosso-pharyngeus;* third, the *par vagum*, or *pneumo-gastric;* fourth, the *superior respiratory*,—generally known as the *spinal accessory;* fifth, the *phrenic*, or *internal respiratory;* and sixth, the *external respiratory* (p. 129.) He proves,—incontestably as it appears to me,—that all these nerves act in a circle, and that they perform an office altogether confined to the necessities of one function—that of breathing. The *facial respiratory* is the nerve of the nostrils, lips, and muscles, as well as the skin, of the face, giving the *diversified expression* to the features, which the human countenance so eminently possesses; the *fifth pair* being the *sensitive organ* of the same parts. The *glosso-pharyngeus*, as its name imports, supplies the root of the tongue, and the pharynx, as well as the larynx in some degree. The *par vagum*, or *pneumo-gastric*, is that from which the substance of the lungs itself derives its chief nervous influence. The *superior respiratory* is expended on the sterno-cleido-mastoideus and the trapezius; the *phrenic*, on the diaphragm; and the *external respiratory*,—which Bell considers as a counterpart of the *phrenic* (p. 133), and which is intimately connected with that nerve at its origin,—is almost entirely distributed to the serratus magnus anticus.

In this arrangement we see that the large muscles of the upper portion of the trunk,—besides being supplied liberally with nerves both of motion and sensation, springing from the anterior and posterior columns of the spinal marrow,—obtain a considerable quantity of nervous matter from the same nervous column, and close in the same neighbourhood from which the *phrenic* derives its own; that at least one of these powerful muscles has a large share of nervous influence from a source *identical with the phrenic itself*; and we may believe with Bell (p. 151), that the *superior and external respiratory* nerves are to the *sterno-cleido-mastoideus*, the *trapezius*, and the *serratus magnus muscles*,—which raise the chest, and contribute largely to the act of inspiration,—what the *phrenic* is to the *diaphragm*. When these external respiratory muscles and the diaphragm therefore act in concert, which they must necessarily do, as they derive their nervous supply from the same source, the one, by being depressed, would expand the chest downwards, while the other, by being elevated, would enlarge it upwards. To make this circle complete, and for the purpose of transmitting the stimulating influence of the external air to the muscular structures, both within and without the body, the nerves of the skin form intricate meshes with those that ramify on the muscles below them; and in the case of the intercostals, *the nerves absolutely perforate the muscles to expend themselves on the integuments.*

How easy and natural, then, does not the explanation seem! The cuticular nerves at the upper part of the trunk receive the stimulus, transmit it to the respiratory branches lying just below them; these carry the influence impressed upon them directly to the *central column of the medulla oblongata*, where the *phrenic* takes its origin; and thus the diaphragm is incited to its first contraction, as are also the external muscles of the chest. As soon as the air is admitted into the lungs, the extremities of the *par vagum*,—which has no cutaneous branches,—take fire, as it were, on the application of the hitherto untasted stimulus, and—obedient to the laws that govern the minutest fibre in the animal economy—watch unremittingly over the organ that Nature has intrusted to their care, so long as the principle of vitality holds its sway over any portion of the animated frame.

Sir C. Bell, indeed, considers that "as the common nerves of the spinal marrow certainly possess a power over the abdominal muscles, controlling them in the act of respiration, it is not an unwarrantable supposition, that the respiratory column descends along the spinal marrow, constituting a part of it, and bestowing power upon the spinal nerves" (p. 23). And this supposition seems borne out by an experiment made by Dr. J. Reid, who, after dividing the *pneumo-gastrics*, and removing the *contents of the cranium*, divided also the spinal cord, high up in the neck, so as to cut off the communication between the *spinal nerves* and the *medulla oblongata*. He found that the frequency of the respiratory movements was very greatly diminished, though they were not entirely suspended (Carpenter, Human Physiol. edit. 3, parag. 375). This experiment confirms,—what had been long known,—that the presence of the *brain* is not essential to breathing life;—that the seat of the respiratory function is located in the *medulla oblongata*; and that other nerves, besides the *pneumo-gastrics*, are concerned in this vital action:—we have seen above what they are. It proves also, what Bell surmised, that the spinal marrow itself affords an influence that, in no small degree, assists in the regularity of the respiratory motions.

When we contemplate the almost infinite and very intricate ramifications of the branches of nerves which supply the neck, chest, back, and throat, we could have no difficulty in explaining the first inspiration on the principle of nervous impression, carried out by *common reflex action only*, as Carpenter (parag. 375) imagines. Yet the establishment of respiration is of such essential and *paramount* importance to the newly-born animal, that it seems as though Nature would not be content with any *indirect* and *circuitous* method of producing the effect she aims at; but has obviated the chance of any misadventure occurring, by having instituted a *direct connection* at their roots between the nerves that are acted on by the stimulus of the external atmosphere, and those that furnish sensibility and motion to the great organ of breathing situated deeply within the body:—for, after all, it is the first descent of the *diaphragm* which sets a light to the train, and which originates those actions that are to continue in fervid operation until the grasp of Death paralyses at once both nervous susceptibility and the last struggle of muscular contraction.

Dr. Carpenter (parag. 375) would lead us to infer that nervous influence was the occasion of the first inspiration; and that the nerves of the face were the chief instruments in the institution of this process;—the fifth, and not the seventh, being, according to him, the principal agent (parag. 301). Although the nerves of the face may have a part in this great work, they are certainly not the sole—nor are they, in my opinion, the chief—agents; because, as I have observed at p. 351, I have many times, when the breech had originally presented, known the child make an effort to breathe, after the body was born, while the head was still entirely in the vagina, closely embraced by the walls of that canal; and when it seems impossible to suppose that any of the nerves supplying the face could feel the stimulus of the external air. But in these cases, those ramifying on the integuments of the neck, chest, and back, were freely exposed to it.

We may presume that the stimulus of the air applied to the cutaneous nerves is the agent in exciting the first inspiration; because, if the child is born covered by the membranes, although the mouth is exposed to the air, it will not breathe until they are torn from its face and the upper part of the trunk, so that perfect exposure may take place. This fact I have myself had an opportunity of observing. Again, Buffon and Haller have proved that, if an animal be expelled into warm water immediately from the uterus, although it lives for a considerable time, no attempt at respiration is made until it is removed from its bath, and brought under the stimulating excitement that the air affords. Dr. M. Hall has shown that if the *cerebrum* be removed, and the *pneumo-gastrics* divided in a young kitten, the spinal marrow being preserved entire, the number of inspirations will be reduced to four in a minute; but, by directing a stream of air on the animal, or by irritating various parts of the surface, twenty or thirty acts of respiration may be excited within the same time (Carpenter, parag. 375). That mechanical excitement on the surface will produce an effort at inspiration, was also proved by Beclard, who, on irritating the skin of fœtal kittens, still inclosed in their membranes, found attempts made to breathe whenever the irritation was applied.

The circumstance above mentioned, namely, that stronger stimulants than the atmospheric air,—such as the application of spirit to the surface,—are sometimes required to call forth an impression on the extremities of the cutaneous nerves, which were insensible to the milder influence of the atmosphere, powerfully tends to confirm this opinion; as do also the facts, that a drop of spirit let fall upon the root of the tongue will rouse into activity the hitherto dormant respiratory apparatus; and that the nervous energy, when torpid, may often be awakened by subjecting the infant, immediately on its birth, to a little rough usage.

The sudden sob occasioned by dashing cold water over the neck and chest of a girl under an hysterical faint, is an evidence of the close sympathy that exists between the cutaneous nerves ramifying over this part of the person, and those supplying the diaphragm; and on plunging into a cold bath, it is clearly the shock received on the upper part of the body that occasions the violent spasmodic action in that muscle. The converse of this proposition also holds equally good; for the sardonic grin exhibited on the countenance of a person whose diaphragm is wounded, proves that the *respiratory nerves of the skin* are as obedient to irritation excited on the extremities of the *phrenic nerve*, as the *phrenic* itself is to a stimulus applied to the *cuticular branches*.

All these facts plainly indicate to us that any stimulation we may think it necessary to use, for the purpose of calling back to life an infant expelled into the world with animation suspended, should be employed upon the *upper part* of its frame.

It appears to me that the subject of the resuscitation of children, apparently still-born, has not been regarded by medical men with the attention that it deserves. But, besides Dr. Snow's paper, mentioned above, which will well repay perusal, one will be found in the fifteenth number of the Provincial Medical and Surgical Journal,—from the pen of Mr. Toogood, exemplifying the advantage derived from a steady perseverance in inflation, with the sentiments expressed in which I perfectly coincide.

M.

MONSTROSITY.—*Deficiency of parts.*—Of all the irregularities of monstrosity, instances in which there exists a deficiency of parts are most commonly met with; and this deficiency may exist in many organs. Among those that can be brought under the examination of the eye, the mouth and lips are perhaps most frequently the seat of this anormal development. Sometimes there is a simple fissure in the upper-lip, forming the single hare-lip: at other times there is a double fissure, and a want of a greater or less portion of the palate; sometimes, again, the palate is faulty, while the lips are perfect. Not unfrequently also, there is some imperfection in the genitals. The anterior part of the bladder and the parietes of the abdomen, just above the pubes, have been found wanting; so also has a portion of the muscles and integuments round the navel. In the former case the mucous lining of the bladder is continuous at its circumference with the skin, and forms a soft, red, sensitive protuberance in the pubic region; the ossa pubis do not meet, and the recti muscles are separated to some extent. Such an extensive malformation could not exist without disturbing the arrangement of the genital organs. In the latter, the intestines in the neighbourhood of the umbilicus appear to have no covering but the peritoneum, and the chorion and amnion continued from the placenta. Often a large portion of the bowels is received into the cord itself; and cases are on record in which the whole contents, both of the abdomen and chest, were without the protection of their usual parietes, a very curious case of which deficiency will be found recorded by Dr. Drew, in the Medical Times and Gazette, for September 8, 1855, p. 236. The septum between the ventricles of the heart, and occasionally the diaphragm, have been deficient, or imperfect. Sometimes one or both arms, at others the legs, are scarcely formed at all; and when this is the case, Nature seems to make up for the deficiency by granting an extra growth to other parts; thus, in a fœtus preserved in the London Hospital Museum, the head and trunk are nearly twice the natural size, while the arms and legs are not more than three inches long. A want of the spinous processes of three or four contiguous vertebræ, is not a very uncommon species of monstrosity. This constitutes *spina bifida,* or *hydrorachitis spinosa.* There is usually a soft, fluctuating tumour in the situation of the malformed bones, caused by water contained within the sheath of the spinal marrow. A midwife under my superintendence delivered a woman, a few years since, of twins, each labouring under spina bifida situated low in the lumbar vertebræ.

But the most interesting and singular variety of deficient organisation is exemplified in what is denominated the *anenkephalous* monster. In this there is a total want of the bones at the side and upper part of the cranium, as well as of the brain and the membranes ordinarily covering it. The *basis cranii* is ill-shaped, and covered by a membrane continuous with the integuments. There is no forehead, but the skull runs backwards from the superciliary ridge. Sometimes, under the membrane at the base of the skull, there is a quantity of soft pulpy matter; but more frequently the spinal marrow commences, as it were, abruptly. The preparations of the anenkephaloid fœtus (which have been multiplied *ad infinitum,* and specimens of which may be found in every museum), prove that the case is by no means very rare; and they show also that the brain is not essential to our being while in utero; for many of these children have arrived at the full intra-uterine size—nay, some are actually larger than an ordinary fœtus; as if Nature had intended to compensate for the loss of the brain by allowing an exuberant growth to the body. In these instances the nerves are well-formed, and even those of the senses which ordinarily terminate in the cerebral mass itself—such as the optic—are not wanting. Anenkephaloid children have been known to live some hours, and even days. I myself saw one alive thirty-six hours after its birth, which cried, (though feebly,) sucked, and seemed to perform all the animal functions much more perfectly than could have been supposed. The spinal marrow has been found wanting in some cases, when the brain was deficient. A woman was lately living in Double X Place, Globe Road, Mile End, who has had six children, and each alternate one has been anenkephalous, the others healthy, and born living. It has been observed by her attendant, that with each of the monstrous fœtuses there was an excessive quantity of liquor amnii; not so, however, with the others. In June, 1823, a friend of mine living in Nottinghamshire sent me an anenkephaloid fœtus. of seven months intra-uterine age. He was not present when the child was born, but the nurse told him she never saw such a quantity of liquor amnii; the patient "was almost smothered with it." Many explanations have been offered to account for the origin of the *anenkephaloid* fœtus. The true, is that given by Professor Rudolphi, of Berlin: he has proved by a collection of specimens, that it originates in *hydrokephalus;* and the last fact that I have mentioned would seem to bear out this view of the question; for I have myself observed that when the fœtus is dropsical in any part of its person, there is an excessive quantity of liquor amnii. My friend Dr. Mackenzie, of Glasgow, wrote to me, "When visiting the Anatomical Museum at Berlin, in 1817, Professor Rudolphi pointed out to my attention a series of preparations explanatory of the formation of acephali. Embryonic hydrocephalus is the cause. He showed me an embryo, on the upper part of whose head was a vesicle ready to burst:—a second, in whom the envelopes of the brain had burst, the pieces floating round the basis of the skull;—and a third, in whom these floating remnants were partly gone, thus verging on the common acephalus, as we find it when born after nine months intra-uterine life." For the same statement regarding this philosophical and interesting discovery of Rudolphi, see Dr. Beattie, in Med. Gazette, April 17th, 1846, p. 707.

Redundancy of parts.—Organs are not unfrequently redundant; thus occasionally there are supernumerary thumbs, fingers, or toes: such an irregularity being sometimes confined to one limb, sometimes affecting all. It is evidently both erroneous and unjust to call a child a monster, merely because it possesses a toe or a finger more than the natural number; for the very word conveys a horrible, or at least an unpleasant, impression. It is worth remark, that this deviation from natural formation sometimes runs in families. Meckel (Pathol. Anatomy, vol. i. p. 19) has observed this; there is a curious case of the same kind in the fourteenth volume of the Med. Gaz., p. 65; and two similar instances have come under my own eye. In the year 1831, two children were brought to my house, twin boys, of a fortnight old, one of them with a supernumerary finger and toe on each hand and foot, the other with one only extra finger on the right hand; the toes had apparently well-formed joints, by which they were connected to the metatarsal bones; the fingers merely hung by a pelicle of skin. I saw the mother afterwards, and found she had a supernumerary finger and toe on each hand and foot, with perfect joints, and capable of motion. She told me she had borne twenty-one children—that all the girls but one were born with extra fingers and toes; but only one of the boys, besides the twins, was affected in the same manner. She also said her mother and one of her sisters were the subjects of the same kind of irregularity. The other case much resembled this.

Sometimes a larger and more important member than a finger or toe is supernumerary. Thus Sir E. Home has described, in the 80th volume of the Philosophical Transactions, an Indian child which had two heads, united together at their crowns,—the upper one being inverted. The subject died of the bite of a rattle-snake, when it was about four years old. It was found that the two skulls were nearly of the same size—equally complete in ossification. "The frontal and parietal bones, instead of being continued over the top of the head, meet each other, and are united by a circular suture. The two skulls are almost equally perfect at their union; but the superior skull, as it recedes from the other, becomes imperfect, and many of its parts are deficient. The number of the teeth is the same in both. There is no septum of bone between the crania, so that the two brains must have been contained in one bony case." The dura mater of each, however, was continued across, so as to divide the cerebral masses from each other, and their membranes were perforated by a number of large vessels by which the upper brain was nourished. The skull was deposited in the Hunterian Museum, and is now in the possession of the Royal College of Surgeons.

In the lower animals monstrosities occur much more frequently than in man; and the domesticated are more obnoxious to those irregularities than those in the wild state. Monstrous pigs, sheep, puppies, kittens, ducks, and chickens, are to be seen in every collection of specimens devoted to the elucidation of the subject of reproduction.

Two children have been joined together, by the back, the sides, and by the sternum and abdomen. Plates 82 and 83, the originals of which are in the London Hospital Museum, show the possibility of such a confusion. Nor are such specimens by any means singular; but many similar are preserved. Instances, indeed, are not wanting of individuals variously connected by nature, surviving their birth, and even living to maturity. The far-famed Hungarian sisters, who were born in Szony, on October 26, 1701, and exhibited in most countries of Europe, form an instance in point. These girls were united at the lower part of their loins, and sacra; but instead of standing back to back, their faces and bodies were placed half sideways in regard to each other. They had but one anus and one vulva; their viscera were all double, except that the two vaginæ united at their extremity, and the two recta had a similar arrangement. They were not equally strong, nor of equal plumpness, and were separately affected by hunger and the calls of nature; one was more sickly than the other, and often suffered convulsions, while the other was well. One often slept while the other was awake. They lived till they were nearly twenty-two years old, and menstruated at different times. They died almost at the same instant. (See Philos. Trans. vol. L.)

While these sheets were in the press, two African children, girls, were brought to London for exhibition, united like the Hungarian sisters by the sacra. They are five years old, and are as well-grown and plump as most children of the same age. One of them is rather larger than the other, which was the case when they were born. The band of union is sixteen inches in circumference; it commences about the inferior edge of the first division of the sacrum, and involves all the bone below that line to the extremity of the coccyx. The point, which may be distinctly felt, is blunter than ordinary, as though the two bones were fused into one. There is no doubt that the bones themselves are joined together by ossific deposition; and the union extends throughout the right half of the lower part of the sacrum belonging to one child, and the left half of that belonging to the other, and along the whole of the coccyges of both; including at the same time the posterior edge of the sacro-iliac symphysis, below the posterior superior spinous process of the ilium. There is consequently a deeper sulcus at the junction of the bodies on one side than on the other;—on the shallower side the bony connection can be well made out; on the other the bony union cannot be felt, the skin not being sufficiently yielding. All the four tuberosities of the ischia appear perfectly distinct. There is but one anus, occupying the position it would naturally do as regards the coccyx, in one of the children, provided that child was separated from its sister. In a corresponding part of the body belonging to the other child, there is a deep, blind depression, such as we see in one variety of imperforate anus, looking very much, when superficially examined, as if it were the termination of another rectum. Within the anus the finger passes into a wide cavity, the common continuation of the two intestina recta; and the place where the two bowels unite into one canal is out of its reach.

There are two sets of external genital organs at the lowest point of the union of the two bodies;—two hymens, two clitorides, and two meatus urinarii; but there is no fourchette; for the labia externa of each running backwards, in relation to each body, behind the symphysis pubis, meet the labia coming from the other, and by their junction produce an appearance of there being only one vulva. Each of the conjoined labia is not longer than an ordinary labium of a child of the same age,—about one inch,—and the fossa navicularis, although it contains a double set of external organs, is but little larger than if it belonged to a single child. The genital fissure, instead of commencing anterior to the lower part of the symphysis pubis, begins quite underneath at some distance behind the symphysis. Each symphysis pubis is formed as natural; and they are separated from each other by a considerable space. The anus is on one side of the vulva, so that what answers to the perineum, about half an inch in extent, runs laterally to the tip of the coccyx, which is somewhat twisted to one side. There are two vaginæ and without doubt two uteri.

The children stand not quite back to back, but rather sideways; so that they are able to place their arms round each other's neck, and give each other a kiss; but they cannot walk side by side. When lying one reclines on her back, and the other upon her side.

Their systems do not act at all in unison; for one can be awakened without disturbing her sister; one is often hungry when the other is not; one indeed is sometimes eating while the other is sleeping; and their pulses are far from synchronous. Although there is but one anus, the action of the bowels is distinct to each, and performed by each at different times, the one giving the other intimation of the inclination. If aperient medicine is administered to one it does not affect the other. There is reason to believe that although the sacra are united, the caudæ equinæ are separate, and each enclosed within its own proper sheath; for if the external genital organs of one are touched the other does not feel it; and the same remark applies to their lower extremities, as well as all other parts of their persons. They run about with amazing ease and activity.

Their dispositions are both very amiable, though one is milder than the other in temper, the little one possessing the most "pluck;" and their intelligence is equal to, if it does not exceed, that of most European children of the same age. They play together with their toys; they seldom have contrary wishes; and although there are at times little *tiffs* between them, they have never been known to have a downright quarrel.

These particulars I obtained from the gentleman who has the charge of them. He tells me he has never seen their mother; but was informed by their aunt, who was present at their delivery, that the labour was rather tedious, though not to be considered difficult; and that they were small at their birth. I cannot learn what part of their bodies presented, nor in what position they passed through the pelvis.

In the year 1829 we had, in Britain, an opportunity of seeing an example somewhat analogous to the sisters of Hungary, and those of Africa, in the persons of the Siamese twins, who were born in May, 1811, and consequently were eighteen years old. They stood five feet two inches high. These boys were connected by a band about four inches long and eleven in circumference, situated at the lower part of the sternum, involving the ensiform cartilages, which were united together at their points, and possessing at its lower face an umbilicus. The length of the band allowed them to turn a little sideways towards each other. It was supposed by those physiologists who paid most attention to this interesting case, that there was a canal running the whole length of the band, lined by peritoneum, and that thus the two abdominal cavities communicated with each other. From each body a protrusion of some part of the abdominal viscera took place into the band, whenever a fit of coughing came on, or any sudden exertion was undergone; and the sense of feeling in the skin of the band was connected with each boy as far as the middle of its length from his person. They were of very affectionate disposition and docile temper, and their intellectual powers were acute; no superiority in this respect could ever be discovered in one over the other. Their nervous systems seemed to act more in unison than in the case of the sisters; for they both slept at the same time, and one could not be awakened without rousing the other; their pulses were not always alike. Hunger affected both simultaneously; they both preferred the same kind of food, and were both satisfied with nearly the same quantity, and at the same time. But the vascular systems were distinct, or had but slight communication; for asparagus eaten by the one did not impregnate with its peculiar odour the urine of the other; and not the least pulsation could be distinguished in the band. I am told by a gentleman who saw them six months ago that they are now living in North Carolina, being more than forty-four years old; that they are farmers in easy circumstances, possessing slaves and other property; that they are *both married*, their wives being sisters, and that they have four or five children a-piece. It will be interesting to know what occurs whenever one of them may cease to live. Their mother informed Captain Coffin, who brought them over to England, that she suffered no greater inconvenience at their birth than at those of her other children; that they were born with the head of one between the legs of the other, and as infants were rather small. I presume by this description, that at their birth the band was twisted completely round; and that the breech of one and head of the other passed together. Three or four other cases of double fœtuses, who lived for different periods, are on record.

Instances also are recorded of the union of a perfect with a partially developed body, of which A-Ke, a Chinese, sixteen years old, may be adduced as an example. He had the loins, nates, upper, and lower extremities, of a small parasitical brother escaping from the abdomen between the umbilicus and the sternum. This prodigy, I believe, was shown in England some years ago, and small models of his person must be familiar to every one who has had the curiosity to inquire into this subject. Another case very similar to the last is related by Ambrose Paré, whose testimony, although he deals in many most marvellous stories, is, in this instance, at least, not to be treated lightly. The man exhibited himself in Paris in 1530, was forty years old, and had growing out of his abdomen a smaller body perfect in all its parts, but wanting the head and shoulders. Paré has given a drawing of this, as well as many other monstrous productions, some highly probable, but most of them absurd, and perfectly incredible;—and Palfyn gives the history of a man having a small body attached in the same way; but in this instance, also, there were arms external, and the head only was wanting. Winslow relates that he saw a girl of twelve years old, well formed, and of the common size, with the abdomen and lower extremities of another body hanging from the left side of the epigastric region; and in the 79th volume of the Philosophical Transactions there is the account of a well-made Gentoo boy, who had the pelvis and lower limbs of a little brother suspended from the pubes.

Rueffe, Paré, and Palfyn, all speak of a man, alive in 1519, from whose abdomen a small though well-formed head appeared to grow; and Winslow saw, in 1698, an Italian, who had another head, much less than his own, connected to the chest below the cartilage of the third rib. The man felt any impression on this *extra* head.

Bartholin (who saw the person) and Zacchias relate the case of an individual named Lazarus Colloredo, æt. 28, of common stature, and well formed, who had a deformed twin brother, John, hanging by the chest from the lower part of the sternum. His head was larger than that of Lazarus: he had two arms, with three fingers on each hand, but only one lower extremity. Respiration was hardly perceptible, but there was evident pulsation in the thorax; he was nourished by the food taken in by Lazarus.

Again, an imperfect body has been found entirely enclosed within another. In the Gentleman's Magazine for December, 1748, mention is made of a child born with a large bag extending from the perineum to the toes, which in a few days burst, and a mass of florid flesh protruded, in which were distinctly perceptible a hand and foot, with perfect fingers and toes; but no organs could be traced, nor any rudiments of either sex. Richerand mentions a lad named Bissieu, who died at thirteen years old, and who, from his earliest infancy, had a tumour on the left side of the lower part of his abdomen, which was very painful. He was seized with fever and increase of pain in the prominent part, and voided by stool purulent and fœtid matter, and a ball of hair; after which he soon sank. The tumour was found to consist of a cyst, having a recent communication with the transverse colon, and containing the rudiments of a fœtus. There was discovered a brain, spinal marrow, very large nerves, muscles, and the skeleton of the head, vertebral column, pelvis, and imperfect limbs, with a short umbilical cord attached to the mesocolon. No organs of digestion or respiration, urinary or generative, could be found. The case was drawn up at length by M. Dupuytren; and drawings were made by MM. Cuvier and Jadelot; and a detailed account was published in the "Bulletin de l'Ecole de Médecine," "Gazette de Santé," 1804, and some other works of the period. A somewhat similar case was published by Mr. George Young, in the first volume of the Medico-Chirurgical Transactions: it was of a child whom he saw frequently during life, in consequence of a tumour in the abdomen, which gradually increased till his death; he survived nine months. A cyst was found occupying a large portion of the abdomen, which contained four pints fourteen ounces of greenish limpid fluid, and an imperfectly formed fœtus adhering to it by a conical process arising from the umbilicus. The surface was covered with that sebaceous matter so usually found on the skin of infants at birth; and the skin itself was rosy, and of a healthy look. The extremities were distinct, but short and thick; the fingers and toes were furnished with nails; there was a well-formed penis, and a cleft scrotum. There was no brain, nor spinal marrow, nor diaphragm; neither heart, nor liver, nor urinary organs, nor any internal organs of generation. Scarcely any muscular fabric was discovered in the whole mass. The alimentary canal was the most perfectly formed of the internal organs; a part of the intestines, indeed, was in all respects naturally constructed. Mr. Highmore, a surgeon of Sherborne, in Dorsetshire, opened the body of a boy named Thomas Lane, between fifteen and sixteen years old, in June, 1814, in which he found the rudiments of a human fœtus. The two last-mentioned specimens are preserved in the Museum of the Royal College of Surgeons.

In l'Histoire de l'Académie Royale des Sciences, vol. ii. p. 298, 1733, there is an account given by M. de Saint Donat, a surgeon at Sisterton, of a fœtus found in the scrotum of a man. And Velpeau presented to the Paris Academy, in 1840, a preparation of the rudiments of a fœtus—the whole mass being as large as a doubled fist—which he had removed from its connection with the right testicle of a man, æt. 27, named Gallochat. The tumour had existed from his birth, and had increased up to the time when he was three or four years old.—(See Gazette Médicale, February 15th, 1840; copied into the London Medical Gazette, March 13th, 1840.)

Parts misshapen, though properly situated, are by no means uncommon; sometimes this unnatural formation is the result of defective, sometimes of redundant, organisation; thus the different features of the face may be malformed; the scrotum is sometimes cleft; the urethra and rectum imperforate. Club feet are usually classed among this variety of monstrosity; but it appears to me that they often owe their origin to accidental causes rather than natural formation. The distortion may not unfrequently arise from the limb being cramped in utero, owing, perhaps, to the awkward position in which the child lies, or to there being but a small quantity of liquor amnii.

Misplacement of perfectly formed parts is the least common of all kinds of monsters. I do not know that, even among all the extravagant stories in the older works, there is any account of a well-formed arm rising from the pelvis, or a leg from the scapula; and we should certainly not give credence to it, were we to meet with such a tale. But the viscera have occasionally been found transposed, both in the chest and abdomen; and such a case may be considered a monstrosity of this description. When the viscera of the chest are transposed, those of the abdomen are almost always in the same condition; but there are some exceptions to this general observation. I do not know any instance on record, however, of the abdominal viscera being transposed, where the chest did not also participate in the malformation. In the 18th volume of the Medical Gazette, p. 393, for June 11th, 1836, there is a paper by Dr. Watson, in which he enumerates thirty-three cases of this irregularity: nineteen of the subjects were males; six were females; and in eight the sex is not mentioned: in four the anomalous formation was detected during the lifetime of the individual. A fœtus with the heart on the right side, and other viscera transposed, is preserved in the London Hospital Museum; the subject was in other respects misformed. And in the same volume of the Med. Gazette just cited, p. 600, a case is given by Mr. Cooper, of Brentford, of a female infant, in which the viscera of the chest were transposed; but those of the abdomen were in their natural situation; so that these cases are not so singular as some have imagined.

It may be thought a needless waste of time to enter so much at large, even in an Appendix, upon subjects from which no practical good appears likely to result; but its interest has seduced me into these details. Besides, by studying Nature in her imperfections and irregularities, we are more likely to arrive at some knowledge of her laws, than if we regard her only in her healthy condition. By learning what parts she can dispense with, we ascertain those organs essential to existence; and by tracing the deviations from her common course, we may perhaps be hereafter led to a more correct acquaintance with her *methodus agendi.*

It is a curious fact, which may perhaps contribute something to a knowledge of the cause of these irregularities, that when one child of twins is the subject of any intra-uterine malformation, the other, for the most part, is also affected with a similar deviation from the natural formation. Thus, besides the two instances above mentioned, of the twins with spina bifida, and those with extra digits, I was consulted, four or five years ago, by a hospital surgeon, respecting the sexes of twins newly born; they had both exactly the same kind of enlargement of the clitoris, very much resembling a penis, just such as is very well represented in the cut inserted in my lecture, which was published in the Med. Gazette for November 9th, 1833, page 184. Having the original preparation of that drawing in my mind, I gave my opinion that the children were females, and should be named accordingly. This advice was, however, over-ruled by the gentleman who referred them to me; and they were baptised as boys. They both died within a few weeks of their birth, and on dissection it was discovered that they were girls. On another occasion I saw twins, each having a hare-lip.

Origin.—It is not my intention to endeavour to account for the origin of monstrous formations in general; but I may cursorily state, with regard to deficient and redundant monsters, that some suppose the germ, before impregnation, is improperly formed; others, that it is an undue admixture of prolific particles at the moment of fecundation; others that monstrosity has taken place after conception, owing to some irregular vascular excitement, or deficiency of nourishment;—thus the vessels of the redundant part being more numerous, and more active than they ought to be, produce an excess of growth, whilst those of the deficient part are just in a contrary condition. Where a connection of two children, nearly or quite perfect, exists, I cannot help thinking that union takes place not only after fecundation, but after the fœtuses have grown to a certain size. In the cases of the Siamese twins, the Hungarian sisters, the African girls, or the original of Plate 82, I presume that they were originally true twin conceptions, but that the membranes which ought to have enveloped each body, so as to form an inseparable barrier between them, were imperfect, and that, in consequence, the bodies were allowed to come into close contact with each other; that there is such a strong formative power existing in the vascular system of the fœtus, that when the two cuticular surfaces came together, vessels shot from one to the other, and the parts became permanently united by adhesion, in the same way that two fingers would coalesce, provided the skin was removed and they were kept in apposition. We know that sometimes twins are contained in the same bag of membranes, and in such case, provided they lay for any length of time in contact, we may believe it quite possible for a junction of the two bodies to occur.

Richerand (Elem. of Physiology, Trans. 1815, p. 462) tells us, "By placing in a confined vessel the fecundated ova of a tench, or any other fish, the numerous young ones which are formed, not having space sufficient for their growth, adhere to each other, and fishes truly monstrous are produced." And in the vegetable kingdom it is not very unusual for two fruits, in contact and cramped in their growth, to unite indissolubly.

N.

Plural Births.—Besides the instance mentioned in the text—putting out of the question the extravagant stories related by Ambrose Paré, Shenckius, Petrus Borelli, and others—there are a few more well-attested cases of five children at a birth. One will be found in the Gentleman's Magazine for 1736; the patient lived in the Strand; another, in the same periodical, 1739, at Wells, Somersetshire; one occurred in Upper Saxony; one near Prague in Bohemia. (Garthshore. Philosoph. Trans. 1787.) Chambon relates a case of five, which lived long enough to be baptised. (Campbell's Mid. p. 291.)

In the British and Foreign Med. Review for 1839, a notice is given of a woman—Guiseppa Calfani—at Naples being delivered of five children at seven months; in the Dublin Med. Journal for January, 1840, there is an account given of Dr. Evory Kennedy having shown to the Dublin Pathological Society five ova of between two and three months, which were expelled at once under the superintendence of Dr. Thwaites. They were all male children. I have already alluded to Mr. Wardleworth's case at p. 525. Mrs. Wright, the wife of a shoemaker, No. 11, Rochester-terrace, Rochester-row, Westminster, was delivered of five boys at a birth, on Jan. 14th, 1849. She supposed herself seven months advanced; but the fœtuses were only seven inches long. She was attended by a midwife of the name of Roberts; and Mr. Russel, of Oliver Street, Milbank, was called to her in her labour. The children are preserved. A case of five at a birth occurred in Franklin County, America, about the year 1828, as reported by Dr. Paddock (Dublin Journ. of Med. Science, vol. xvi. p. 533, first series.) Mrs. Mauger, of St. Owen, Jersey, had five daughters at a birth at six months, on May 20, 1840. (From a well-attested certificate left at my house in 1841.) And if we could credit newspaper reports, we might add the following:—The wife of a cannon-founder at Luginski, in Russia, was delivered, on May 22nd, 1836, of five girls, of whom four were living and likely to do well. (Satirist, Aug. 7, 1836.) The Giornale del Due Sicilie states, that a woman was safely delivered on June 21, 1838, of a boy and four girls; all of whom died at the expiration of half an hour. (Times, July 23, 1838.) The wife of a landed proprietor at Altruitweida, near Mitweida, in Saxony, was recently delivered of five daughters, who, though perfect in their conformation, died in about half an hour after their birth. (Times, Aug. 29, 1838.) A woman in New Hampshire was delivered of five living children at a birth, in the beginning of the year 1841. (Times, June 4th, 1841.) Again, Aulus Gellius, in his "Attic Nights," book 10, chap. 2, says that one of the servants of Augustus Cæsar had five children at a birth, who lived a few days; but their mother dying a short time after they were born, Augustus caused a monument to be raised to her memory in the *Via Laurentina;* and that Aristotle relates of an Egyptian woman who also had five children at a birth. Fuller, in his history of the "Worthies of England," tells us that a woman is buried in Dunstable churchyard, whose epitaph mentions that three several times she had three children at a birth, and twice five. "How many survived to man's estate is unknown." (1662, *see* Bedfordshire, p. 119.) So that Dr. Hull's case is by no means without a parallel.

The most miraculous instance of supposed fecundity in a human female is that of the Countess Henneberg, recorded on a marble tablet, which still is, or at least was, in the church of Lonsdunen, near Leyden. The monument bears the following announcement:—

> "En tibi monstrosum nimis et memorabile factum,
> Quale nec a mundi conditione datum,
> Ostendam."

After which lines follows a prose account of the miracle; to wit, "That Margaret, wife of Hennan, Earl of Henneberg, and daughter of Florence, the fourth Earl of Holland and Zealand" (then we are favoured with her pedigree for many generations), "being about forty years old, upon Easter-day, 1276, at 9 A.M., was brought to bed of 365 children, all of which were baptised in two brazen basins by Guido, the suffragan of Utrecht. The males, how many soever there were of them, were christened John, all the daughters Elizabeth; who all, together with their mother, died on the same day, and with their mother, lie buried in this church of Lonsdunen." This supernatural infliction is accounted for on the principle of retributive justice; for we are informed that the countess, being solicited for alms by a poor woman who was carrying twins, shook her off with contempt, declaring that she could not have them by one father; whereupon the poor woman prayed to God to send her as many children as there were days in the whole year; "which came to pass, as is briefly recorded in this table, for perpetual recollection, testified as well by ancient manuscripts as by many printed chronicles." (For a brief notice of this "fact," "upon unquestionable record," see *Evelyn's Discourse on Medals*, fol. 1697, p. 267. And a circumstantial account will be found in the "*Lectiones memorabiles et reconditæ*" Johannis Wolffii, edit. 2nd. Frankfort, 1671, vol. 2, p. 433, anno 1536.)

The credulity of the people who raised the memorial must create a smile; and yet, no doubt, the story may not be without some slight foundation. It is probable that the poor lady died after having *given birth* to a number of watery cysts, which were looked upon as ova. A very slight stretch of the imagination might transform them into children in embryo, and in the rigid adherence to the Roman Catholic forms of worship, it might have been thought necessary that the baptismal ceremony should be performed: in fact, they were nothing more than a mass of hydatids, (the same, indeed, as all other cases of so-called abortions in which it was presumed many ova were expelled,) as is clear from the declaration, that "they were baptised in two brazen basins." The noble lady probably sank from flooding.

O.

I have subjoined a tabular view of some of the particulars of the cases that occurred in the eastern district of the Royal Maternity Charity, between the 1st of January, 1820, and the end of December, 1850, amounting in the aggregate to 68,435 deliveries. For the first four years my father had the undivided charge of the patients; till the end of the year 1827, I was joined with him in the duty; from that time till the middle of the year 1834, the whole devolved upon me. After that date, district surgeons were appointed to act in cases of great emergency, and I was relieved of a large part of the hard work; but nevertheless I retained a general superintendence over the midwives, and kept a faithful record of the patients. For a further account of these cases I may refer to the London Medical Gazette, January 31, 1829; February 27, 1830; March 5, 1831; February 25, 1832; to each number from May 3, to July 19, 1844, inclusive; and from October 3rd to November 14th, 1851, also inclusive.

A Table showing the comparative number of some of the difficulties and irregularities that occurred in the Eastern District of the Royal Maternity Charity, between January 1*st*, 1820, *and December* 31*st*, 1827 ; *partly under the superintendence of Dr. Ramsbotham, and partly of Dr. Ramsbotham and Dr. F. H. Ramsbotham conjointly.*

Years.	Number of Deliveries.	Placenta.		Convulsions before and after labour.	Forceps long and short.	Craniotomy.	Ruptured uterus and vagina.	Apoplexy under labour.	Transverse presentations.	Difficulty under twins.	Difficulty from extreme obesity.	Vectis case.	Laceration of the broad ligament causing hæmorrhage into the abdomen during labour.
		Presenting; complete and partial.	Adherent or retained.										
1820	2583	—	15	4	5	8	2	—	5	—	—	—	—
1821	2665	6	10	1	5	3	2	—	4	1	—	—	—
1822	2693	4	14	3	3	4	—	—	12	—	—	—	—
1823	2711	6	13	3	6	5	—	—	6	1	1	—	1
1824	2474	3	16	3	6	4	—	—	10	—	—	—	—
1825	2180	5	19	5	4	1	1	—	6	—	—	—	—
1826	2050	4	25	2	7	—	—	—	8	2	1	1	—
1827	2083	2	23	3	3	—	—	1	11	—	—	—	—
Total	19,439	30	135	24	39	25	5	1	62	4	2	1	1

From this table we see that out of 19,439 deliveries, there were 62 cases of transverse presentations: being in the proportion of 1 in every 313·5 deliveries; or 0·32 per cent.

That 30 were placental presentations, either complete or partial: 1 in 647·99; or 0·15 per cent.

That in 135 the placenta was retained or adherent, requiring the introduction of the hand for its removal: 1 in 143·99; or 0·7 per cent.

That 24 were complicated with convulsions, either before or after delivery: 1 in 809·99, or 0·12 per cent.

That 25 women were delivered by craniotomy: 1 in 777·56, or 0·13 per cent.

That 39 were delivered by the forceps, either long or short: 1 in 498·44; or 0·2 per cent.; and 1 by the vectis.

That there were 5 cases of ruptured uterus or vagina: 1 in 3887·8; or 0·026 per cent.

That in 1 case the patient was attacked with apoplexy during labour; not attended with convulsive action.

That in 1 the broad ligament lacerated during labour, causing fatal hæmorrhage into the abdominal cavity.

That in 4 cases of twins there was some difficulty or danger before the second child was born: 1 in 4859·75; or 0·02 per cent.;

And in 2 there was difficulty from extreme obesity on the part of the mother; 1 in 9719·5 or 0·01 per cent.

P.

A Table showing some of the Particulars of the Cases that occurred in the Eastern District of the Royal Maternity Charity, between January 1, 1828, *and December* 31, 1850; *under the superintendence of Dr. F. H. Ramsbotham.*

Years.	Number of Deliveries.	Plurality.		Sex.		Presentation.			Children Born		Mothers	
		Twins.	Triplets.	Boys.	Girls.	Head.	Breech or lower extrem.	Trans-verse.	Living.	Still.	Recovered.	Died.
1828	2400	22	—	1264	1158	2329	86	7	2316	106	2392	8
1829	2202	28	—	1156	1074	2142	81	7	2135	95	2191	11
1830	2221	26	—	1161	1086	2181	59	7	2168	79	2207	14
1831	2144	26	—	1134	1036	2102	60	7	2081	88	2132	12
1832	2344	33	—	1197	1180	2320	51	6	2287	90	2331	13
1833	2619	22	—	1372	1269	2573	64	4	2556	85	2603	16
1834	2447	26	—	1285	1188	2408	57	8	2394	79	2437	10
1835	2311	16	—	1229	1098	2263	57	7	2241	86	2304	7
1836	2268	22	1	1150	1142	2215	73	4	2202	90	2260	8
1837	2140	26	—	1085	1081	2113	40	13	2079	87	2127	13
1838	2136	25	—	1115	1046	2087	68	6	2076	85	2127	9
1839	2079	18	—	1082	1015	2044	48	5	2012	85	2070	9

TABLE CONTINUED.

Years.	Number of Deliveries.	Plurality.		Sex.		Presentation.			Children Born		Mothers	
		Twins.	Triplets.	Boys.	Girls.	Head.	Breech or lower extrem.	Trans-verse.	Living.	Still.	Recovered.	Died.
1840	2173	27	—	1144	1056	2131	60	9	2120	80	2165	8
1841	2167	27	—	1124	1070	2143	44	7	2107	87	2161	6
1842	2090	19	—	1075	1034	2068	40	2	2041	69	2079	11
1843	2002	23	—	1037	988	1977	42	6	1953	72	1991	11
1844	1936	21	1	1002	957	1896	55	8	1899	60	1926	10
1845	1819	23	—	966	876	1804	32	6	1778	64	1815	4
1846	1782	18	—	896	904	1749	44	7	1742	58	1776	6
1847	1746	21	—	938	829	1731	33	3	1705	62	1741	5
1848	1964	21	1	1063	924	1936	43	8	1918	69	1950	14
1849	2141	24	—	1154	1011	2106	46	13	2077	88	2134	7
1850	1865	22	—	1000	887	1842	37	8	1828	59	1857	8
Total	48,996	536	3	25,629	23,909	48,160	1220	158	46,815	2723	48,776	220

A Table showing some of the Particulars of the Cases that occurred in the Eastern District of the Royal Maternity Charity, between January 1, 1828, *and December* 31, 1850, *under the superintendence of Dr. F. H. Ramsbotham.*

Years.	Placenta.			Hæmorrhage.		Convulsions.		Forceps.		Craniotomy.	Ruptured uterus.	Premature labour induced.	Apoplexy after labour.	Ruptured vagina.	Lacerated labium.	Lingering breech case, requiring instruments.	Second child of twins turned.	Face presentations.	Ear presentations.	Inversion of the uterus.	Total.
	Presenting.		Adherent or retained																		
	Complete.	Partial.		Accidental.	After labour.	Before delivery	After delivery	Long.	Short.												
1828	—	3	13	3	3	1	1	3	—	6	—	—	—	—	—	2	—	8	—	—	43
1829	1	—	15	8	6	1	2	3	2	1	—	1	—	—	1	—	1	12	—	—	54
1830	1	1	20	7	11	3	1	2	2	1	1	2	1	—	—	—	—	8	—	—	61
1831	—	3	17	7	6	1	2	3	—	3	—	2	—	1	—	1	—	7	—	—	53
1832	2	1	25	11	5	—	1	2	—	2	—	4	—	—	—	1	—	8	1	—	63
1833	2	—	18	5	9	3	2	—	—	3	—	3	—	—	—	—	—	12	—	—	57
1834	1	—	10	5	6	1	1	3	1	—	1	1	—	—	—	—	—	17	3	—	50
1835	2	1	8	7	5	4	—	1	2	1	—	1	—	—	—	—	—	8	1	—	41
1836	4	4	8	3	4	1	—	—	2	—	—	2	—	—	—	—	—	8	—	—	36
1837	2	—	16	10	1	1	2	1	2	2	1	1	—	—	—	—	—	10	1	—	50
1838	1	—	11	6	4	—	—	—	3	—	2	1	—	—	—	—	—	7	—	—	35
1839	4	1	14	7	—	1	—	1	2	2	—	—	—	—	—	—	—	8	—	—	40

TABLE CONTINUED.

Years.	Placenta.			Hæmorrhage.		Convulsions.		Forceps.		Craniotomy	Ruptured uterus.	Premature labour induced.	Apoplexy after labour.	Ruptured vagina.	Lacerated labium.	Lingering breech case, requiring instruments.	Second child of twins turned.	Face presentations.	Ear presentations.	Inversion of the uterus.	Total.
	Presenting.		Adherent or retained	Accidental.	After labour.	Before delivery	After delivery	Long.	Short.												
	Complete.	Partial.																			
1840	6	4	9	10	1	—	1	2	4	4	—	—	—	—	—	—	—	9	—	—	50
1841	1	—	16	10	—	—	—	—	—	6	1	1	—	—	—	—	—	7	—	—	42
1842	4	—	9	11	3	1	—	—	1	3	1	1	—	—	1	—	—	4	—	—	39
1843	1	—	7	6	8	—	—	1	6	4	1	—	—	—	—	—	1	8	—	—	43
1844	4	1	11	7	6	—	—	1	3	4	—	1	—	—	—	—	—	5	—	1	44
1845	8	5	6	6	10	1	1	—	3	5	—	—	—	—	—	1	—	2	—	—	48
1846	—	3	9	5	1	1	1	1	1	1	—	1	1	—	—	1	—	4	—	—	30
1847	1	2	8	6	3	2	—	1	3	2	—	1	—	—	—	—	1	4	—	—	34
1848	2	1	10	6	8	4	—	1	2	5	—	—	—	—	—	—	2	3	—	—	44
1849	3	1	9	8	8	1	1	1	4	2	—	—	—	—	—	—	—	3	—	—	41
1850	1	—	9	5	—	—	—	—	3	3	—	—	—	—	—	—	—	—	—	—	21
Total	51	31	268	159	108	27	16	27	46	60	8	23	2	1	2	6	5	162	6	1	1019
	82					43		73													

MATERNAL DEATHS FROM ALL CAUSES.

Years.	From Puerperal Causes, or attributable to the Puerperal State.	Phthisis.	Chronic Pneumonia.	Chronic Bronchitis.	Apoplexy.	Hæmoptysis.	Chronic Laryngitis.	Influenza.	Scarlatina.	Asiatic Cholera.	Fever.	Dropsy.	Organic Disease of the Heart.	Sloughing Polypus Uteri.	Total.
1828	6	1	—	—	—	—	—	—	—	—	—	—	1	—	8
1829	7	1	—	—	—	—	—	—	1	—	2	—	—	—	11
1830	12	1	1	—	—	—	—	—	—	—	—	—	—	—	14
1831	7	2	2	—	—	1	—	—	—	—	—	—	—	—	12
1832	10	—	1	—	—	—	—	—	—	2	—	—	—	—	13
1833	9	5	—	—	—	—	1	—	—	—	1	—	—	—	16
1834	7	—	—	—	—	—	—	—	—	2	—	1	—	—	10
1835	7	—	—	—	—	—	—	—	—	—	—	—	—	—	7
1836	7	1	—	—	—	—	—	—	—	—	—	—	—	—	8
1837	8	3	—	—	—	—	—	1	—	—	1	—	—	—	13
1838	8	—	—	—	—	—	—	—	—	—	—	—	1	—	9
1839	7	—	—	—	—	—	—	—	—	—	2	—	—	—	9

TABLE CONTINUED.

Years.	From Puerperal Causes, or attributable to the Puerperal State.	Phthisis.	Chronic Pneumonia.	Chronic Bronchitis.	Apoplexy.	Hæmoptysis.	Chronic Laryngitis	Influenza.	Scarlatina.	Asiatic Cholera.	Fever	Dropsy.	Organic Disease of the Heart.	Sloughing Polypus Uteri.	Total.
1840	7	—	—	—	—	—	—	—	—	—	—	—	—	1	8
1841	6	—	—	—	—	—	—	—	—	—	—	—	—	—	6
1842	10	—	1	—	—	—	—	—	—	—	—	—	—	—	11
1843	8	1	1	—	—	—	—	—	1	—	—	—	—	—	11
1844	7	—	1	—	—	—	—	—	—	—	1	—	1	—	10
1845	3	1	—	—	—	—	—	—	—	—	—	—	—	—	4
1846	3	1	—	—		—	—	—	—	—	—	—	1	—	6
1847	3	1	—	—	—	—	—	—	—	—	1	—	—	—	5
1848	14	—	—	—	—	—	—	—	—	—	—	—	—	—	14
1849	3	—	—	1	—	—	—	—	—	2	1	—	—	—	7
1850	3	4	—	1	—	—	—	—	—	—	—	—	—	—	8
Total	162	22	7	2	1	1	1	1	2	6	9	1	4	1	220

Note.—221 total deaths; 58 not from puerperal causes.—The deaths from puerperal causes include all cases of inflammation of the lungs, and other organs, which originated *after* labour, within the puerperal month; as well as all cases of fever, except those that evidently arose from external infection, not connected with the puerperal state, as scarlatina and typhus.

MATERNAL DEATHS FROM PUERPERAL CAUSES.

Years.	Hæmorrhage.		Convulsions.		After Craniotomy.	After Forceps.	Ruptured Uterus or Vagina.	Peritonitis.	Hysteritis.	Diffused Pelvic Inflammation.	Irritative Fever without loss of Blood.	Collapse.	Intestinal Irritation.	Common continued Fever.	Puerperal Mania.	Pneumonia.	Apoplexy after Labour.	Exhaustion after Lingering Labour.	Exhausted from want, after Shoulder Presentation.	Inversion of Uterus.	Bronchitis.	Enteritis.	Total.
	Immediate.	Remote.	Before Delivery.	After Delivery.																			
1828	1	2	—	—	—	—	—	2	—	1	—	—	—	—	—	—	—	—	—	—	—	—	6
1829	3	3	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7
1830	—	6	—	—	1	1	1	2	—	—	1	—	—	—	—	—	—	—	—	—	—	—	12
1831	2	2	—	—	1	—	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	7
1832	3	1	—	—	1	—	—	3	—	—	—	1	1	—	—	—	—	—	—	—	—	—	10
1833	4	—	—	1	1	—	—	—	—	—	—	—	—	1	—	2	—	—	—	—	—	—	9
1834	2	1	—	1	—	—	1	—	1	—	—	—	1	—	—	—	—	—	—	—	—	—	7
1835	—	1	—	—	—	—	—	3	2	—	—	—	—	—	—	—	1	—	—	—	—	—	7
1836	2	1	—	—	—	—	—	2	—	—	—	—	—	—	2	—	—	—	—	—	—	—	7
1837	—	2	—	—	—	—	1	1	—	—	—	—	—	—	—	1	1	1	1	—	—	—	8
1838	2	—	—	—	—	—	2	—	1	—	—	—	—	2	1	—	—	—	—	—	—	—	8
1839	2	1	—	—	—	1	—	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7

TABLE CONTINUED.

Years.	Hæmorrhage.		Convulsions.		After Craniotomy.	After Forceps.	Ruptured Uterus or Vagina.	Peritonitis.	Hysteritis	Diffused Pelvic Inflammation.	Irritative Fever, without loss of Blood.	Collapse.	Intestinal Irritation.	Common continued Fever.	Puerperal Mania.	Pneumonia.	Apoplexy after Labour.	Exhaustion after Lingering Labour.	Exhausted from want, after Shoulder Presentation.	Inversion of Uterus.	Bronchitis.	Enteritis.	Total.
	Immediate.	Remote.	Before Delivery.	After Delivery.																			
1840	2	3	—	—	—	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7
1841	2	—	—	—	—	—	1	1	1	—	—	—	—	—	—	—	1	—	—	—	—	—	6
1842	3	2	—	—	—	—	1	1	2	—	—	—	—	—	—	—	—	—	—	—	—	—	9
1843	3	—	—	—	1	—	1	1	—	1	—	—	—	—	—	2	—	—	—	—	—	—	9
1844	1	2	—	—	—	—	—	2	1	—	—	—	—	—	—	—	—	—	—	1	—	—	7
1845	1	—	—	—	—	—	—	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	3
1846	2	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	3
1847	—	—	—	—	—	—	—	1	—	1	—	1	—	—	—	—	—	—	—	—	—	—	3
1848	1	1	1	—	—	—	—	4	5	—	—	—	—	—	—	—	—	—	—	—	1	1	14
1849	1	1	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3
1850	—	—	—	—	—	—	—	1	—	—	—	—	1	—	—	—	—	—	—	—	—	1	3
Total	37	29	1	2	6	3	9	30	15	3	2	2	3	3	3	5	3	1	1	1	1	2	162

66

3

Note.—**The cases of death from apoplexy might be added to the column of deaths from convulsions; but I have thought it better to keep them separate; as I do not wish to mix up any theory with these tables.**

CAUSES OF THE CHILDREN NOT BEING BORN LIVING.

Years.	Premature, either spontaneous, or induced artificially.	Putrid at full time, or nearly so.	Breech at full time, or nearly so.	Transverse ditto.	Under Placental Presentation.	Under Accidental Hæmorrhage.	Under Craniotomy.	Under Forceps.	Monstrous.	Under Lingering Labour.	Under Convulsions.	Mother nearly moribund, from Cholera, &c.	After Fright, Anger, or Accident to Mother.	With Prolapsed Funis.	Hand and Head delivered by Turning.	Under Face Presentation.	Under Ruptured Uterus or Vagina.	One of Twins, no other Cause assigned.	One of Triplets, no other Cause assigned.	Born with Abscess in the Neck.	Not accounted for.	Total.
1828	24	9	11	3	1	3	6	—	—	—	1	—	—	6	—	1	—	—	—	—	41	106
1829	27	18	16	4	1	6	1	—	1	—	1	—	—	6	—	—	—	—	—	—	14	95
1830	27	9	9	4	1	1	1	2	1	—	3	—	—	6	—	—	1	—	—	—	14	79
1831	29	11	14	3	1	4	3	—	—	2	—	—	—	7	—	—	1	—	—	—	14	89
1832	30	13	6	1	3	5	2	—	1	5	—	2	—	8	—	—	—	—	—	—	13	89
1833	22	16	11	4	1	—	3	—	4	3	1	1	—	7	—	—	—	—	—	—	11	84
1834	34	4	14	7	1	4	—	—	1	—	—	—	1	4	—	—	1	—	—	—	8	79
1835	26	6	16	4	2	6	1	1	2	3	3	—	—	6	—	—	—	—	—	—	10	86
1836	23	6	17	3	2	1	—	—	1	3	1	—	4	6	—	1	—	—	—	—	22	90
1837	23	15	5	6	2	4	2	—	2	2	2	—	3	8	—	1	1	—	—	—	11	87
1838	19	12	14	3	1	2	—	1	1	4	—	—	—	12	—	2	2	—	—	—	12	85
1839	21	6	15	3	3	3	2	2	—	6	—	1	2	8	—	1	—	—	—	—	12	85

TABLE CONTINUED.

Years.	Premature, either spontaneous, or induced artificially.	Putrid at full time, or nearly so.	Breech at full time, or nearly so.	Transverse ditto.	Under Placental Presentation.	Under Accidental Hæmorrhage.	Under Craniotomy	Under Forceps.	Monstrous	Under Lingering Labour	Under Convulsions	Mother nearly moribund, from Cholera, &c	After Fright, Anger, or Accident to Mother.	With Prolapsed Funis	Hand and Head delivered by Turning	Under Face Presentation.	Under Ruptured Uterus or Vagina	One of Twins, no other Cause assigned.	One of Triplets, no other Cause assigned	Born with Abscess in the Neck.	Not accounted for.	Total
1840	10	14	8	5	9	6	4	2	2	2	—	—	3	8	—	1	—	—	—	—	6	80
1841	14	18	9	6	—	6	5	—	4	2	—	—	1	6	—	—	1	—	—	—	15	87
1842	23	9	3	2	4	5	3	1	—	4	—	—	7	3	—	—	1	—	—	—	11	69
1843	21	7	6	3	—	4	4	2	—	6	—	—	1	8	—	—	1	—	—	—	9	72
1844	11	6	8	7	1	3	4	1	—	1	—	—	7	4	—	1	—	2	—	—	4	60
1845	14	7	10	2	6	2	5	2	2	8	1	—	2	1	1	1	—	—	—	—	—	64
1846	11	12	14	5	2	3	1	2	1	1	—	—	1	—	—	1	—	1	—	—	3	58
1847	20	8	9	1	3	4	2	—	4	3	2	—	1	2	—	—	—		—	—	3	62
1848	10	7	13	5	2	4	5	—	2	1	3	3	4	4	—	1	—	3	1	—	1	69
1849	22	11	17	11	4	6	3	1	1	3	—	3	1	2	—	—	—	1	—	—	2	88
1850	17	6	8	5	—	3	3	—	—	3	—	—	2	6	—	—	—	—	—	1	5	59
Total	478	230	258	97	50	85	60	17	30	59	18	10	33	128	1	11	9	7	1	1	240	1822

Note.—For the three first years no account was taken of the still-born births under lingering labour; nor for the first six of any accident that might have happened to the mothers. Two of the craniotomy cases were hydrokephalic; the monstrous births include the cases of hydrokephalus that passed without operation, as well as dropsy of the abdomen, &c.

IT THUS APPEARS,

That out of 48,996 deliveries, there were 536 cases of twins: 1 in 91·4; or 1·094 per cent.; and three cases of triplets: 1 in 16,332; or 0·0061 per cent.

That of the 49,538 children born, 25,629 were males: 51·736 per cent.; 23,909 were females: 48·264 per cent.; or, in other words, that the excess of males over females was as nearly as possible 3·5 per cent.

That 48,160 were presentations of some part of the head, of which 162 were face presentations: 1 in 297·06; or 0·336 per cent; and 6 were ear presentations: 1 in 8026·7; or 0·0125 per cent.

That 1220 were presentations of the breech, or some part of the lower extremities: 1 in 40·6; or 2·462 per cent.; and 158 transverse presentations: 1 in 313·53; or 0·0319 per cent.

That 47,716 were born living: 96·3 per cent.

That 1822 were born still: 1 in 27; or 3·7 per cent.

That 220 women died either within a month after delivery, or from the effects of labour: 1 in 222·7; or 0·45 per cent.

But that only 162 of these deaths could be attributed to a puerperal cause: 1 in 302·5; or 0·3306 per cent.

That 83 were placental presentations, either partial or complete: 1 in 590·3 cases; or 0·17 per cent.

That in 268 cases the placenta was retained, or adherent, requiring the introduction of the hand for its removal: 1 in 182·82; or 0·547 per cent.

That 159 were cases of accidental hæmorrhage: 1 in 308·15; or 0·325 per cent.

That in 108 cases hæmorrhage took place after delivery of the placenta: 1 in 453·7; or 0·2205 per cent.

That 43 were complicated with convulsions either before or after delivery: 1 in 1139·44; or 0·09 per cent.; and 2 with apoplexy after labour.

That 60 women were delivered by craniotomy: 1 in 816·6; or 0·123 per cent.

That 73 were delivered by the forceps: 1 in 671·2; or 0·119 per cent.

That in 23 premature labour was induced: 1 in 2130·26; or 0·047 per cent.

That there were 8 cases of ruptured uterus: 1 in 6124·5; or 0·0164 per cent.; 1 of ruptured vagina; and 2 of lacerated labium: 1 in 24,498; or 0·004 per cent.

That 6 were cases of breech presentation, requiring instrumental delivery: 1 in 8256·4; or 0·0121 per cent.; and that in 5 cases of twins, the second child was delivered by turning: 1 in 9799·2; or 0·0102 per cent.

That of the 162 deaths from puerperal causes, 66 were from hæmorrhage, either immediate or remote: 1 in 2·46; or 40·75 per cent.

That the deaths from hæmorrhage, either immediate or remote, in proportion to the whole deliveries, were 1 in 742·37: or 0·135 per cent.; and in proportion to the number of cases of hæmorrhage: 1 in 9·2; or 10·9 per cent.

That there was 1 death from convulsions, which came on before delivery.

That there were 2 deaths from convulsions, which came on after delivery: 1 in 24,498; or 0·004 per cent. of the total deliveries; the cases of death from convulsions being nearly 1 in every 14·3 cases of that disease.

6 after craniotomy: 1 in 10; or 10 per cent. of the cases in which that operation was performed; and 1 in 8166; or 0·0143 per cent. on the whole number of deliveries.

3 after the forceps had been used: 1 in 24·3; or 4·11 per cent. of the cases in which that instrument was employed; and 1 in 16,332; or 0·0061 per cent on the whole number of deliveries.

That 30 women died of peritonitis: 1 in 1633·2; or 0·061 per cent. on the whole number of deliveries; and 1 in 5·4; or 18·52 per cent. of the deaths from puerperal causes.

15 of hysteritis: 1 in 3266·4; or 0·03 per cent. of the whole number of deliveries; and 1 in 10·8; or 9·26 per cent. of the deaths from puerperal causes.

3 of diffused pelvic inflammation: 1 in 16,332; or 0·0061 per cent.

3 of common fever, caught after labour: 1 in 16,332; or 0·0061 per cent.

3 of puerperal mania: 1 in 16,332; or 0·0061 per cent.

3 of apoplexy after labour: 1 in 16,332; or 0·0061 per cent.

5 of pneumonia taken after labour: 1 in 9799·2; or 0·0102 per cent.
1 of acute bronchitis; 1 of inversion of the uterus; 1 of enteritis; 3 of intestinal irritation; and 2 of collapse.

THE TABLE ALSO SHOWS,

That of the 58 deaths not attributable to puerperal causes,
34 were from diseases of the lungs, or the air passages, of which 22 were confirmed phthisis; and that
4 were from diseases of the heart.
That 9 women died of typhus fever;
6 of Asiatic cholera, then raging; and
2 of scarlet fever,—all caught during pregnancy.
1 of dropsy;
1 of a sloughing polypus of the uterus; and
1 of apoplexy, 28 days after labour.

STILL BIRTHS.

It is also apparent, that out of the 1822 *still-born children*,
478 were premature: 1 in 3·8; or 26·95 per cent; and
230 were putrid at full time, or nearly so: 1 in 7·9; or 12·66 per cent.
That 253 were breech presentations, out of 1220 breech cases at full time, or nearly so: 1 in 4·82; or 20·8 per cent.
That 97 were transverse presentations, out of 158 transverse cases at full time: 1 in 1·63; or 61·4 per cent.
That 50 were under placental presentations, out of 83 cases: 1 in 1·66; or 0·6 per cent.
That 85 were under accidental hæmorrhage, out of 159 cases: 1 in 1·87; or 53·52 per cent.
That 17 were delivered by the forceps, out of 73 cases: 1 in 4·05; or 24·66 per cent.
That 60 were delivered by craniotomy.
That 18 were born under convulsions, out of 27 cases, in which the attack occurred before delivery: 1 in 1·5; or 66·7 per cent.
That 62 were born under very lingering labour: 1 in 30·81; or 3·24 per cent on the number of still-born children,—and 1 in 839·63; or 0·12 per cent on the whole number born.
That 9 were born under ruptured uterus or vagina: 1 in 202; or 0·49 per cent. on the number of still-born children.
That 128 were born under prolapsed funis: 1 in 14·2; or 7·04 per cent. on the number of still-born children; and 1 in 393; or 0·255 per cent on the whole number born.
That 11 were under face presentation: 1 in 165; or 0·61 per cent; and
That 30 were monstrous: 1 in 60·6; or 1·65 per cent. of the still-born children; and 1 in 1651·3; or 0·06 per cent. of the whole number of births.

ON ADDING THE WHOLE OF THESE CASES TOGETHER,

we find that out of 68,435 deliveries,

The placenta was retained, or adherent, so as to require the introduction of the hand for its removal, in 403 cases: being 1 in 169·8; or 0·588 per cent.

The placenta presented wholly or partially in 112: 1 in 611·02; or 0·163 per cent.

The forceps, either long or short, were employed 112 times: 1 in 611·02; or 0·163 per cent.

The craniotomy instruments were used 85 times: 1 in 805·12; or 0·124 per cent. It must be borne in mind, however, that many of these children were unequivocally dead before any attempts were made to deliver; and that in such cases the head was opened, to save the patient from additional pain and danger, when, *perhaps*, she might have been relieved by the forceps.

220 were transverse presentations: 1 in 311·068; or 0·32 per cent.

In 67 cases convulsions appeared: 1 in 1021·4; or 0·098 per cent.

13 were complicated with ruptured uterus or vagina: 1 in 5264·23; or 0·0189 per cent.

3 with apoplexy without convulsive action: 1 in 22,811·7; or 0·0043 per cent.

In 9 cases of twins there was a necessity to deliver the second child, either from lapse of time, hæmorrhage, or some other cause of danger appearing: 1 in 7603·9; or 0·013 per cent.

In 2 there was difficulty from the extreme obesity of the mother: 1 in 34,217·5; or 0·0029 per cent.

And one case of laceration of one of the broad ligaments of the uterus, occurring during labour; which terminated fatally from effusion of blood into the peritoneal cavity, as evidenced upon dissection.

INDEX.

ABDOMINAL PRESENTATION, 365
——— separation of muscles after labour, 540
ABORTION, 683
———, history of, *ib.*
———, causes of, 687
———, symptoms of, 691
———, treatment of, 694
———, treatment of threatened, 692
———, with hæmorrhage, 697
———, with retained placenta, 700
———, practised by the ancients, 723
ABSCESSES in pelvis impeding labour, 227
ACCIDENTAL HÆMORRHAGE, 426
AFRICAN TWINS, account of, 735
AFTER PAINS, violent, 544
AFTER treatment of labour, 146
ALLANTOIS, 82
AMNII, LIQUOR, 65
———, origin, 66
———, use, *ib.*
———, unusual quantity of, in labour, 519
AMNION, 64
ANÆSTHETICS IN LABOUR, 156
———, history of its introduction, *ib.*
———, in surgery, 707
———, degrees of Dr. Snow's, 163
———, deaths from, in labour, 167
———, cumulative property of, 177
———, dangers appertaining to, 178
———, *modus operandi*, 170
———, appearances after death, 180
———, when admissible in labour, 190
ANÆSTHESIA IN SURGERY, history of introduction of, 707
ANIMATION, suspended fœtal, resuscitation under, 727
ANOMALOUS SYMPTOMS during pregnancy, 646
APOPLEXY under labour, 495
APPENDIX, 775
ARM PRESENTATION, 363
ARM, amputation of, in labour, 387
ASCITES, fœtal, impeding the birth, 255
———, under pregnancy, 646

BACK PRESENTATION, 365
BANDAGE after labour, 148
BLADDER, descent of, before the head, 230
———, distended, 249, 259
———, rupture of, 507
BLOOD, transfusion of, 466
———, history of, 725
———, effects of loss of, 470
BLUNT HOOK, 306
BONES of pelvis, 1
——— of fœtal head, 16
BREAST, inflammation of, 552
BREECH PRESENTATIONS, 338
———, management of, 343
———, with feet, *ib.*
———, difficult, 352
———, distortion of the pelvis in, 354
BROAD LIGAMENTS, 42
BROW PRESENTATION, 198

CÆSAREAN OPERATION, history of, 721
———, mode of performance, 321
———, when necessary, 25, 321
CALCULUS impeding labour, 249
CARUNCULÆ myrtiformes, 35
CATHETER, mode of introducing, 261
CHILD, signs of death of, in utero, 314
CHLOROFORM IN LABOUR, *see* ANÆSTHETICS
CHORION, 62
CICATRIX in the vagina, 246
CLITORIS, 33
COCCYGIS, OS, 8
COLLAPSE in labour, 509
COMPLEX LABOURS, 388
CONCEPTION, extra-uterine, 662, *see* FŒTATION

Congestion of the uterus, 546
Contagious diseases in pregnancy, 645
Convulsions, puerperal, 474
———, causes of, 479
———, symptoms of, 480
————, premonitory, 483
———, treatment of, 486
———, hysterical, 494
Cord, umbilical, *see* Funis
Corpora, lutea, 44
———, false, 46
Craniotomy, 302
———, instruments for, 304
———, operation, 309
———, history of, 720
Crochet, 305
———, guarded, 312

Decapitation, 384
Decidua reflexa, 61
——— serotina, *ib.*
Deciduous membrane, 59
Deformity of pelvis, 20, 213
Difficult labour, 204
Disease of os uteri causing lingering labour, 240
Diseases, puerperal, 539
——— of pregnancy, 640
Distension, symptoms in pregnancy dependent on, 643
Dorsal presentation, 365

Ear presentation, 203
Elbow presentation, 363
Ephemera, 576
Ergot of rye in labour, 207
———, history of, 710
Ether in labour, *see* Anæsthetics
Evolution, spontaneous, 382
Examination, vaginal, in labour, 124
Exostosis impeding delivery, 224
External organs of generation, 32
Extra-uterine conception, 662, *see* Fœtation
Exviscration, 384

Face presentation, 200
Fallopian tubes, 51
Fever, puerperal, 596
Fever, scarlet, 636
Fillet, 290
———, whalebone, 291
———, Evans', *ib.*
Firmness, unusual, of head in labour, 254
Five children at a birth, instances of, 739
Flooding, *see* Hæmorrhage
Fœtal animation suspended, 727
——— head, anatomy of, *see* Head
Fœtation, extra-uterine, 662
———, ovarian, *ib.*
Fœtation, abdominal, 662
———, tubal, *ib.*
———, interstitial, or
———, parietal, 663
————, cases of, 663, 665
———, history of, 667
———, cause of, 671
———, symptoms of, 673
———, treatment of, 675
Fœtus, weight of, at birth, 85
———, position of, in utero, 86
———, expulsion of, 108
———, signs of death of, 314
———, controlling growth of, in utero, 326
Fontanelles of fœtal head, 17
Foot presentations, 350
Forceps, history of, 713
———, description of short, 264
———, application of, 267
————, with face in hollow of sacrum, 271
————, to one side of pelvis, 273
————, towards pubes, 275
————, groin, *ib.*
———, symptoms requiring the use of, 276
———, comparative merits of, and Vectis, 287
———, long, 292
————, description of, 293
————, cases fitted for, 295
————, application of, *ib.*
————, cautions respecting, 300
———, advantages over vectis, 289
———, craniotomy, 306
———, Chamberlin's, 715
———, French, 717
Fourchette, 32
Funis umbilicalis, anatomy of, 79
———, disease of, 82
———, coiling of, round child's neck in labour, 135
———, tying the, 137
———, dividing, 139
———, shortness of, in labour, 256
———, disrupted, 459
———, prolapsus of, 511
————, treatment of, 512

Galvanism in lingering labour, 211
Generation, organs of, external, 32
—————, internal, 35
Glands of Naboth, 41
———, skirrhous, in pelvis, 227
Glandular structure in uterine substance, 39
Graafian vesicles, 43
Growth of fœtus, controlling the, in utero, 326

Hæmorrhage, uterine, in labour, 389

Hæmorrhage, uterine, symptoms of, 394
———, treatment of, 395
———, unavoidable, 400
———, accidental, 426
———, after the rupture of the membranes, 433
———, after the child's birth, *ib.*
———, after the removal of the placenta, 461
———, effects of, 470
Hæmorrhoids, 543
Hand presentation, 361
———, by the head, 517
Head, fœtal, shape and dimensions of, 15
———, anatomical peculiarities of, 16
———, expulsion of, 19, 108
———, progression of, 112
———, compression of, 113
———, exit of, *ib.*
———, *presentation* of, marks of, 127
———, malposition of, 192, 198
———, version under, in deformed pelvis, 220
———, dropsical, 251
———, unusual firmness of, 254
———, left in utero, 359
Hidrosis, 629
———, morbid appearances in, 631
———, causes of, 633
———, treatment of, 634
Hook, blunt, 306
Hungarian sisters, account of, 735
Hydrokephalus in labour, 251
Hymen, 34
———, unruptured in labour, 247
Hysteritis, 548

Ilium, os, 2
Induction of premature labour, 327
———, history of, 723
Inflammatory action, symptoms during pregnancy dependent on, 643
Innominatum, os, 2
Inspiration, cause of the first, 729
Instrumental labour, 262
Internal organs of generation, 35
Inversion of uterus, 456
Irregularities of head presentation, 192
Ischium, os, 4

Joints of the pelvis, 13

Knee presentations, 349

Labia externa, 32
——— interna, 33
Labour, natural, 89
———, symptoms of, 91
———, premonitory, *ib.*
———, positive, 92
———, classification of, 100
———, stages of, 103
———, first, 104
———, second, 108
———, third, 116
———, duties in natural, 119
———, after treatment, 146
———, lingering, 204
———, causes of, 205
———, management of a patient under, 119
———, instrumental, 262
———, premature induction of, 327
———, history of, 723
———, lingering, consequences of, 335
———, preternatural, 338
———, complex, 388
Lacque, *see* Fillet
Lever, *see* Vectis
Ligaments of the pelvis, 13
———, *broad*, of the uterus, 42
———, *round*, ditto, 53
Lingering labour, 204
———, *causes of*, 205
———, inefficient uterine action in, 206
———, ergot of rye in, 207
———, borax in, 210
———, external means in, *ib.*
———, galvanism in, 211
———, deformed pelvis, 213
———, pelvic tumours, 224
———, rigidity, 231
———, disease of the os uteri, causing lingering labour, 240
———, rigidity of vagina and perineum, do., 243
———, cicatrix in the vagina, do., 246
———, unruptured hymen, 247
———, obliquity of os uteri, 248
———, distended bladder, 249
———, calculus, *ib.*
———, preternaturally tough membranes, *ib.*
———, dropsical head, 239, 251
———, malposition of head, 192, 198
———, ascites, fœtal, 255
———, tympanites, *ib.*
———, shortness of funis umbilicalis, 256
———, monstrosity, 257
———, management of a patient under, 258
———, distended bladder under, 259
———, consequences of, 335

Liquor Amnii, 65
——, unusual quantity of, in labour, 519
Lochia, character of, 150
——, profuse flow of, 542
——, suppression of, 543
Lutea corpora, 44
——, false, 46

Malposition of head in labour, 192, 198
Mamma, inflammation of, 552
——, causes of, 553
——, treatment of, 554
Mania, puerperal, 580
——, causes of, 585
——, treatment of, 590
Maternity charity, tables of the, 742
Meatus urinarius, 34
Membrane, deciduous, 59
Membranes of the ovum, 62
——, spontaneous rupture of, in labour, 106
——, preternatural toughness of, 249
Miliary fever, 578
Milk fever, 574
Mons veneris, 32
Monsters, labour complicated with, 521
Monstrosity, in labour, 257, 521
——, varieties of, 733
Muscles within the pelvis, 56
——, separation of abdominal, after labour, 540

Nabothi glandulæ, 41
Nipples, excoriated, 557
——, retracted, 561
Nymphæ, 33

Œdema, after labour, 574
Organs of generation, external, 32
——, internal, 35
Osteotomist, 308
Os uteri, anatomy of, 41
——, rigidity of, in labour, 232
——, disease of, causing lingering labour, 240
——, obliquity of, 248
Ovaries, anatomy of, 43
——, removal of, by spaying, 51
——, enlargement of, impeding delivery, 225
Ovum, early, anatomy of, 62
——, membranes of, *ib.*

Pains of labour, 95
——, spurious, 97
——, causes of, *ib.*
——, diagnosis, 98
——, treatment, 100
Paralysis after labour, 574
Patient, position of, in labour, 124
Pelvimeters, 27
Pelvis, bones of, 1
——, form of, 10
——, position of, 12
——, axes of, *ib.*
——, joints and ligaments of, 13
——, difference between male and female, 14
——, deformed, 20, 213
——, version of the child under, 220
——, preternaturally large, 31
——, section of, recent, 53
——, muscles within, 56
Perforator, obstetric, 304
Perineum, 32
——, mode of supporting in labour, 132, 136
——, laceration of, 133
——, bursting of, *ib.*
——, rigidity of, in labour, 243
Peritonitis, puerperal, 598
——, sporadic, 599
——, epidemic, *ib.*
——, allied to Erysipelas, 600
——, causes of, 601
——, symptoms of, 603
——, morbid appearances in, 607
—— treatment of, 610
——, false, 624
Phlegmasia dolens, 562
——, causes of, 566
——, morbid appearances in, 569
——, symptoms of, 570
——, treatment of, 572
Piles, 543
Placenta, anatomy of, 68
——, use of, 70
——, physiology of, *ib.*
——, circulation of, 72
——, Hunter's views of, 70
——, Weber's do., 73
——, Dalrymple's do., 75
——, J. Reid's do., *ib.*
——, Seiler's, Meigs', Adams', do., 71
——, Goodsir's views of nutrition by, 75.
——, twin, 78
——, disease of, *ib.*
——, battledore, 79
——, natural separation of, in labour, 117
——, expulsion of, *ib.*
——, removal of, from vagina, 145
——, presentation, 400
——, symptoms of, 402
——, management of, 405
——, version of, fœtus under, 408

PLACENTA, removal of, before the child, 417
——, partial presentation, 423
——, complicated do., 432
——, retained, 435
——, from atony of the uterus, 438
——, from irregular contraction, 443
——, from morbid adhesion, 447
——, absorption of, 437
——, disrupted, 453
PLURAL BIRTHS, 522, 739
POLYPI in pelvis impeding delivery, 228
POSITION OF PATIENT in labour, 124
PREGNANCY, diseases of, 640
PREMATURE LABOUR, induction of, 327
——, history of the, 723
——, when necessary, 333
PRESSURE, symptoms in pregnancy dependent on, 641
PRETERNATURAL LABOUR, 338
PROLAPSUS UTERI, 541
PUBIS, OS, 5
——, section of symphysis, 324
PUDENDI, labia, 32
PUERPERAL DISEASES, 539
——, FEVER, 596
——, MANIA, 580
——, TYPHUS, 626

REACTION after hæmorrhage, 470
REFLEXA DECIDUA, 61
RESPIRATION, cause of the commencement of, 730
——, theories respecting, 729
RESUSCITATION under suspended animation, 727
RETROVERSION OF THE UTERUS, 647
RIGIDITY of the os uteri, 232
——, treatment of, 234
——, from disease, 240
——, of the vagina, 242
——, perineum, *ib.*
ROUND LIGAMENTS of uterus, 53
RUPTURE of the uterus, 495
——, vagina, 506
——, bladder, 507

SACRUM, OS, 7
——, origin of the name of, 705
SCARLET FEVER, puerperal, 636
——, symptoms of, 637
——, causes of, 638
——, treatment of, *ib.*
SCISSORS, CRANIOTOMY, 304
SECALE CORNUTUM, *see* ERGOT
SECTION OF THE PELVIS, 53
——, CÆSAREAN, 320
——, when necessary, 25, 321
——, history of, 721
—— OF THE SYMPHYSIS PUBIS, 324
SECONDARY FŒTUS, 523
SHOULDER PRESENTATION, 363
SIAMESE TWINS, account of, 736
SIDE PRESENTATION, 364
SIGAULTEAN operation, 324
SKULL, FŒTAL, *see* HEAD
SKYBALA, impeding parturition, 231
SPINE, incurvated, 30
SPONTANEOUS EVOLUTION, 382
STATISTICS of the Royal Maternity Charity, 742
STERNAL PRESENTATION, 365
STONE in BLADDER impeding labour, 249
SUCKLING, 154
SUCTION TRACTOR in labour, 291
SUPERFŒTATION, 532
SUSPENDED ANIMATION, resuscitation under, 727
SUTURES of the fœtal head, 17
SYMPHYSIS PUBIS, section of, 324
SYNCOPE during labour, 509

TABLES from the practice of the Maternity Charity, 742
TRANSFUSION, 466
——, history of, 725
TRANSVERSE PRESENTATIONS, 360
——, symptoms of, 361
TUBES, Fallopian, anatomy of, 51
TUMOURS, pelvic, impeding labour, 224
TURNING, operation of, in transverse presentations, 366
——, in placental presentations, 407
——, under head presentation in deformed pelves, 220
——, under difficult transverse presentation, 374
TWINS, average frequency of, 522
——, AFRICAN, account of, 735
——, HUNGARIAN, do., *ib.*
——, SIAMESE, do., 736
TWIN GESTATION, symptoms of, 525
—— LABOUR, management of, 526
——, position of children in, *ib.*
——, impaction of both heads in pelvis together, 531
TYMPANITES, fœtal, impeding the birth, 255
——, puerperal, 619
TYPHUS, puerperal, 626

UMBILICAL CORD, *see* FUNIS
——, vesicle, 83
UNAVOIDABLE HÆMORRHAGE, 400
URACHUS, 82
URINARIUS, MEATUS, 34
UTERUS, *unimpregnated*, anatomy of, 37
——, glandular structure of, 40
——, mouth of, 41
——, broad ligaments of, 42
——, round ditto of, 53
——, arteries of, 42, 54

UTERUS, nerves of, 42, 54
——, *impregnated*, anatomy of, 57
————, development of, 87
———, rigidity of the mouth of, 232
———, disease of, causing lingering labour, 240
———, obliquity of, 248
———, inversion of, 456
———, rupture of, 495
————, causes of, 496
————, symptoms of, 498
————, premonitory, 505
————, treatment of, 502
———, prolapsus of, after labour, 541
———, congestion of, 546
———, inflammation of, 548
———, retroversion of, 647
————, history of, 648
————, cause of, 650
————, termination of, 651
————, symptoms of, 652
————, treatment of, 655

VAGINA, anatomy of, 35
VAGINA, rigidity of, in labour, 263
——, cicatrix in, 246
——, laceration of, 506
VECTIS, history of, 718
——, description of, 280
——, use of, 284
——, comparative merits of, and FORCEPS, 287
VERSION under deformed pelvis, 220
———, under transverse presentation, 366
———, under difficult transverse presentation, 374
VERTEX PRESENTATION in labour, 108
—————, comparative frequency of various modes of, 105, 195
VESICLES, Graafian, 43
VESICLE, umbilical, 83
VESTIBULE, 34
VULVA, 33

WATERS, FALSE, 65
WEED, 576
WOMB, anatomy of, 37. *See* UTERUS.

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